# Croplife®

A BUSINESSPAPER FOR THE FARM CHEMICAL INDUSTRY

MEMBER, BUSINESS PUBLICATIONS AUDIT

EPA PRODUCTION EDITION

A Miller Publication

Business Journalists Since 1871

Vol. 7 JUNE 6, 1960 No. 22


## News Briefs . . .

**(Complete Stories Inside)**

**A NEW** International Potash Research organization has been formed to exchange latest information, develop cooperation with advisers, and to support research. Dr. H. B. Mann, president of American Potash Institute, is president. **Story page 2.**

●

**CALSPRAY** dedicates new $5 million fertilizer plant at Kennewick, Washington. Latest manufacturing facilities utilized in construction. **Story page 2.**

●

**FIVE REGIONAL** fertilizer safety schools scheduled for late summer and fall, according to Elmer Perrine, chairman of Fertilizer Section of National Safety Council. **Page 2.**

●

**NPFI MEETING** scheduled for Greenbrier Hotel June 12-15 to feature discussion on chemical controls in fertilizer industry. Dr. Vincent Sauchelli, NPFI chemical technologist, will moderate panel. **Story page 2.**

●

**PRICE REVISIONS** have been announced on nitrogen products by both Spencer Chemical Co. and Hercules Powder Co. **Story on page 2.**

●

**FORMATION** of John Deere Chemical Co. is announced by Deere & Co. This is new name for old Grand River Chemical Division of the company. W. W. Yeandle is president. **Story page 28.**

●

**AMERICAN CYANAMID'S** air pollution monitoring system helpful in studying situation at Florida phosphate plant. Better public relations regarded as valuable by-product. **Story page 28.**

●

**OLIN MATHIESON** Chemical Corp. starts operation in new addition to its Pasadena, Texas, facility to make high-analysis fertilizer. **Story on page 30.**

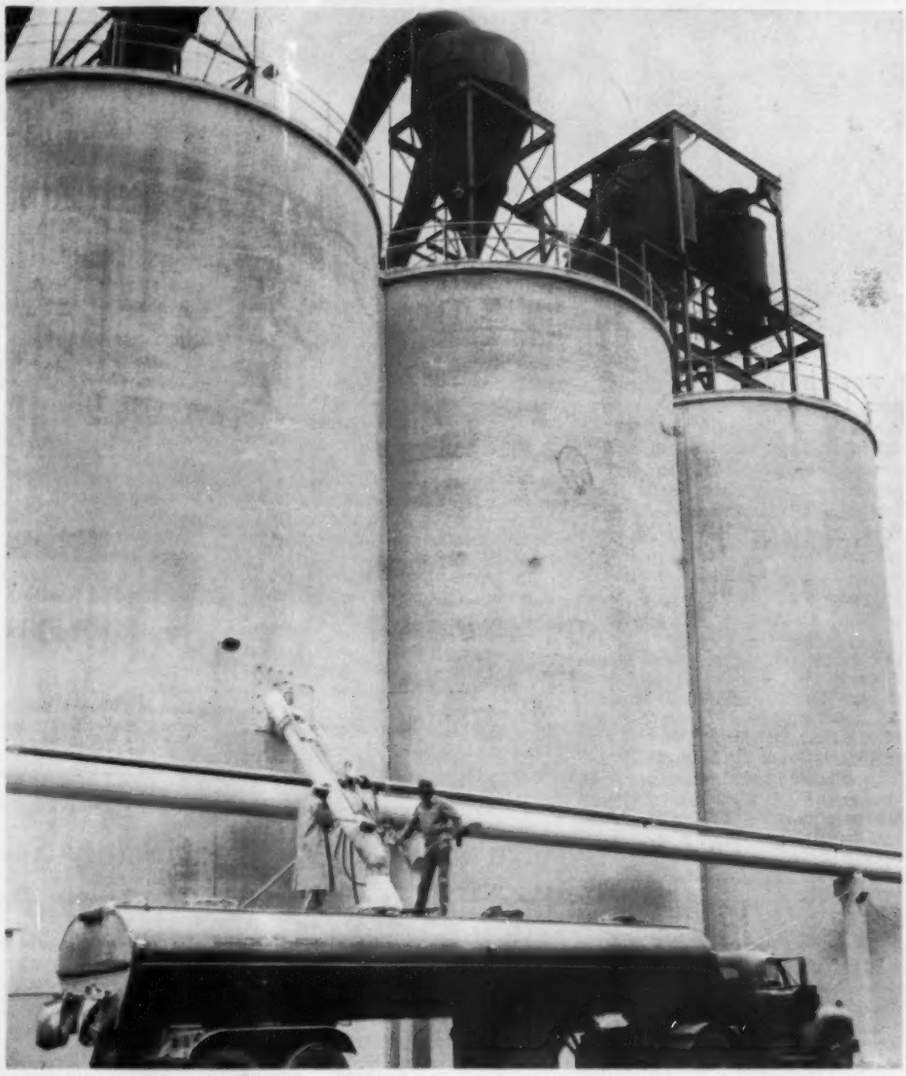
## Features Inside . . .


| | |
|---|---|
| Industry Statistics Needed | 1 |
| Chemagro's Modern Pesticide Plant | 16 |
| Industry's Use of Water on Upward Trend | 22 |
| Georgia Fertilizer Plant Moves When Rail Service Ends | 23 |
| What's New . . . Informative bulletins available | 10 |
| New Process Patents | 25 |
| Personnel Changes in the Industry | 27 |
| Editorials | 32 |
| Meeting Memos | 33 |
| Classifed Advertising | 33 |
| Advertisers' Index | 33 |



Accepted as Controlled Circulation
Published Bi-Weekly by The Miller Publishing Co.
Minneapolis, Minn.

Subscription Rates:
$5 for 1 year; $9 for 2 years

**PHOSPHATE ROCK STORAGE BINS**—Olin Mathieson Chemical Co. recently opened a new section of its Pasadena, Texas facilities for high analysis fertilizers. Here are rock storage bins, with some of the ground rock being drawn off for shipment. (Story on page 30)

# What Are Cost Factors in Plant Operation?

# Benchmark Statistics Needed for Industry

THE PLANT FOOD industry shows a wide disparity between individual companies in the major elements of a fertilizer manufacturing business—the cost of producing the goods it sells, the selling costs and, of course, the profits.

Ratios on such items as material, labor, supervision, and general administrative and selling expenses seem to show a marked change from company to company.

This situation is in sharp contrast with other industries such as drugs, food, packing, department stores, and a wide range of varied enterprises where the statistical information is readily available.

In one survey of more than 20 fertilizer mixing plants, there were widely separated results—one firm getting a profit before taxes of 8.9% of sales, another 4.9%, and a third of only 1.9%.

Ratio of product costs to sales dollars for the first plant is 82.0%, for the second 88.0%, and for the third, 89.1%.

Why should there be such a difference? Why is the laggard plant willing to settle for pre-tax earnings of only 1.9%, and willing to let production costs eat up 89.1% of its sales receipts?

The answers probably cover a wide scope of reasons. Some managers do not realize the all-embracing importance of the cost-sales ratio. Some are careless of costs; some may watch costs sharply but fail to give sufficient recognition to the necessity for earning a return on their investment; and some simply assume that a fertilizer business cannot be managed so as to yield a respectable profit and are willing to settle for whatever they can get.

Unfortunately, one important key to the situation is that managers of fertilizer manufacturing

Turn to **STATISTICS** page 4

Worldwide Research . . .

# International Foundation Formed by 6 Potash Firms

Dr. H. B. Mann

WASHINGTON — Formation of a new international potash research group to develop programs for efficient and beneficial use of potash, has been announced by the six U.S. potash producers instrumental in establishing the new organization. Dr. H. B. Mann, for the past 12 years president of the American Potash Institute, will head the group. He will also continue his present work with the API.

Potash firms participating in the new Foundation are American Potash & Chemical Corp.; Duval Sulphur & Potash Co.; International Minerals & Chemical Corp.; Potash Company of America; Southwest Potash Corp., and U. S. Borax & Chemical Corp.

In describing the activities of the new group, Dr. Mann indicated that the main purpose of the Foundation will be to work closely with agricultural authorities of various countries to increase efficiency of crop production, and to find new markets. The latter is of particular importance, Dr. Mann said, because the industry has developed its production capacity beyond the immediate requirements of North America in which area the American Potash Institute operates. API conducts research and education work throughout the U.S.

J. D. Romaine is vice president of the new organization. He has been associated with potash industry research and education work for the past 30 years, and is also secretary of the American Potash Institute.

The Foundation will work to (1) exchange latest information on potash usage between potash industry members and agricultural authorities in the governments of the various nations served by the organization, (2) develop c'ose cooperation in experimental work between Foundation members and official advisors and farm producers in the various countries, (3) support research and circulate educational information on beneficial results from potash usage, based on scientific findings.

Early activities of the Foundation will center largely in Japan, with some work possibly in Korea and the Philippines. Later plans may include some work in Mexico, Central and South America, the West Indies, Africa and Australasia.

In Japan, the Foundation will undertake agricultural research programs in cooperation with the International Potash Institute of Bern, Switzerland. There, as elsewhere, the job will be to serve the local area by finding and showing potash needs to local advisors and farm producers in a way that will develop agricultural potash usage on a sound foundation.

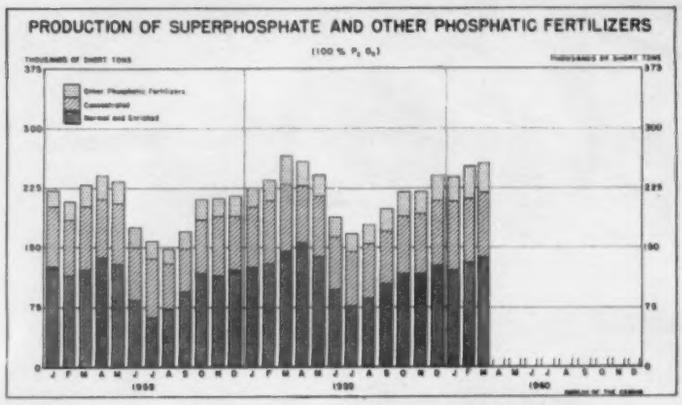
## NPFI MEETING IN READINESS

**WASHINGTON—Everything is in order for the start of the National Plant Food Institute's annual convention at the Greenbrier Hotel, White Sulphur Springs, W. Va., June 12-15, according to Paul T. Truitt, NPFI president.**

**Highlights of the program include a panel discussion on chemical controls in fertilizer manufacturing, with Dr. Vincent Sauchelli, chemical technologist for the institute, as moderator. Other participants will include Edwin M. Glocker, W. R. Grace & Co., Washington Research Center; Stacy B. Randle, president of the Association of American Fertilizer Control Officials, New Brunswick, N.J.; C. H. Russell, St. Louis, Monsanto Chemical Co.; Jim R. Archer, East Point, Ga., International Minerals & Chemical Corp.; Dale C. Keiffer, Norfolk, Va., Smith-Douglass Co., Inc.; Albert Spillman, Baltimore, Md., Fertilizer Manufacturing Cooperative, Inc.**

**Showing of the institute's new sound and color film, "Bread from Stone" is on the agenda, and the group will elect a dozen new directors and officers of the institute at a meeting of the board of directors on June 15.**

**Richard E. Bennett, chairman of the NPFI board of directors and president of Farm Fertilizers, Inc., Omaha, Neb., will welcome the conventioneers in the opening session.**




## PRICE REVISIONS MADE

**WILMINGTON, DEL. — Hercules Powder Co. announced on May 23 a revision of its prices on anhydrous ammonia on the West Coast, effective Aug. 1, 1960. The new schedule of prices of anhydrous ammonia shipped from the Hercules plant, Hercules, Cal., will be $69 per ton, effective Aug. 1, 1960; $72 per ton, effective Oct. 1, 1960; and $75 per ton, effective Jan. 1, 1961. All prices f.o.b. Hercules, Cal., for shipment in tank cars and tank trucks, according to Richard B. Douglas, public relations division, Hercules Powder Co.**

**Spencer Chemical Co., Kansas City, Mo., announced on May 31 a new price schedule for ammonum nitrate effective Aug. 1. The new prices, described as "modest adjustments" provide for seasonal discounts in off-season months of August through December and a base price for the season commencing Jan. 1 of $70 a ton (f.o.b. plant) compared with the current price of $68 a ton.**

**The off-season discounts call for a price of $64 in August and September, and $67 in October, November, and December. The past year's price schedule called for a low off-season price of $63 per ton, increasing each month from September through December by $1 per ton.**

# Superphosphate Production Drops During March, '60

WASHINGTON—Production of superphosphate and other phosphatic fertilizers in the U.S. during March, 1960, amounted to 255,992 tons (100% $P_2O_5$), according to a report just released by the bureau of the census of the U.S. Department of Commerce. According to the report, production was below that of the same month of 1959, which registered 265,920 tons.

Shipments of superphosphate and other phosphatic fertilizers during the same month were likewise on the decrease, according to the report. The total for March, 1960, was 227,268 tons, or a decrease of 14% from the volume shipped during the corresponding month of 1959.

Stocks held by producing plants as of March 31, 1960, however, were also down. Such stocks totaled 325,513 tons, or 12% less than those held on Feb. 29, 1960. These monthly figures, including percentage changes, are unadjusted for seasonal variation and number of working days, the report notes.

The production picture for the period of July, 1959, through March, 1960, however, was more favorable, with total production up 7% and shipments increasing by 3%. Production for the 1960 season was 1,966,963 tons as compared to 1,841,622 tons in the 1959 season. Shipments were 1,395,307 tons and 1,360,995 tons, respectively.

Largest increase in tons and also percentagewise was production of phosphatic fertilizers other than normal, enriched and concentrated. Here the figure for production in the 1960 season was 264,651 tons as compared to 221,452 tons the previous season, for an increase of 20%.

Shipments in these phosphatic fertilizers were likewise up 14%.

# Five Regional Fertilizer Safety Schools Specific for Plant Supervisory Personnel

CHICAGO—Five fertilizer industry safety training schools are scheduled to be held in as many sections of the country in late summer and fall, according to Elmer Perrine, Nitrogen Division, Allied Chemical Corp., New York, chairman of the fertilizer safety section of the National Safety Council.

The schools will be held in New York, Chicago, Wilmington, N.C., Fresno, Cal., and New Orleans, La., Mr. Perrine said. The first one, in New York, is scheduled for Aug. 10-11, and the second, to be held in Chicago, is Aug. 16-17.

With a background of successful training schools in 1958 and 1959, the fertilizer group expects the 1960 series to be even more impressive. Mr. Perrine describes the schools as being "a highly effective method to help safety directors, production managers, plant managers and other su-

(Turn to SCHOOLS, page 33)

## Marlin G. Geiger Dies; Was W. R. Grace Official

BALTIMORE, MD. — Marlin G. Geiger, 62, executive vice president of W. R. Grace & Co. died unexpectedly recently while a passenger in a chartered plane.

Mr. Geiger had been affiliated with Davison Chemical Corp., now a subsidiary of W. R. Grace & Co. He was president of Davison when it became part of the Grace organization, and in 1956 was made executive vice president of the parent firm. He was a graduate of the Pennsylvania State University and has been honored by that institution as a "distinguished alumnus."

# *New Calspray Plant Opened At Columbia River Location*

KENNEWICK, WASH.—California Spray-Chemical Corp. dedicated its new $5 million fertilizer plant with appropriate ceremonies on May 17. The new facility, which had been on stream before the formal opening, produces a complete line of liquid and dry fertilizers. It is situated on a location with favorable shipping facilities and an unlimited water supply from the Columbia River.

The new facility was designed and constructed by the Chemical and Industrial Corp., Cincinnati, Ohio. The plant is composed of three major segments: A high-pressure nitric acid plant with a daily capacity of 150 tons nitric acid on a 100% basis, produced at a 57% concentration; ammonium nitrate prilling plant and solutions section and ammonium nitrate solutions plant; and the complex fertilizer plant.

The nitric acid plant is equipped with an electric motor-driven centrifugal compressor and expander turbine.

The ammonium nitrate prilling plant is equipped with a new process for producing prilled ammonium nitrate which C&I says prills an almost anhydrous ammonium nitrate melt and needs only a small distance of free fall for the pellet to solidify. The prilling tower at the Calspray plant is approximately one-third the height of conventional towers.

This portion of the facilities has a daily capacity of 150 tons of fertilizer grade prilled ammonium nitrate and simultaneously can make quantities of ammonium nitrate-ammonia solutions and other fortified nitrogen solutions.

The complex fertilizer plant incorporates the PEC acidulating and ammoniating section along with C&I's "spherodizer" which pelletizes the slurry after it has been mixed in the first section of the plant.

"WE HAVE BUT TWO PRODUCTS . . . POTASH AND SERVICE"

**W. H. APPLETON**
—Southern Sales Manager for P.C.A.—is a graduate of Auburn University. He taught agriculture at Southern A & M Institute and served with the Alabama Department of Agronomy. Next year will mark his 25th anniversary with the Potash Company of America.

**ROY P. PENNINGTON**
—P.C.A.'s Canadian Sales Representative—served as professor of Soil Technology at Penn State University, is Vice Chairman of the Advisory Fertilizer Board for Ontario and is Western Ontario Director of the Agricultural Institute of Canada.

**Your Men on our payroll**

These men are two of the members of the P.C.A. sales team serving the fertilizer industry. While they are on our payroll, their chief responsibility is to you. Selling potash is but part of their job; the most important part is furnishing you with whatever service and information you require . . . both have the experience and background to do the job well. The P.C.A. salesman is your man . . . make good use of him.

P.C.A. The SALT of the EARTH RED MURIATE

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*Southern Sales Office* . . . Candler Building, Atlanta, Ga.

**How Does OUR Plant Compare? . . .**

# Cost Statistics a Must for Profitable Operation

(Continuation from page 1)

companies have no industry yardsticks against which to measure their operating ratios. There is an appalling scarcity of statistics in the plant food industry.

In other lines, where industry-wide figures are available, if a manager's average costs per sale are running too high in comparison with the industry, he can move to reduce them or, if they can't be reduced, to make other adjustments.

The individual fertilizer operator should be able to do the same—to have check-points against which he could tell at a glance when his cost-sales ratio is badly out of balance. He must have some way of knowing how his averages compare with others.

This recent study was made to provide an initial step toward the development of a set of guideposts by which the manufacturer can gauge his performance.

**For example, according to the results of the study, it would seem that if the cost of goods sold amounts to more than 86% to 87% of the sales price, the operator simply is not making a fair return on his investment.**

The subsidized fertilizer operation that moves along under the support of some other segment of the over-all operations may appear to be an exception, but actually is not.

The 86-87% level is merely a rule-of-thumb figure. But it is the best available at this stage of the fertilizer industry's development—a stage where costs are high, the industry is growing, management has available only the vaguest of industry averages.

The accompanying profit-and-loss statement of the hypothetical "Indiana Fertilizer Co." is made up as a reference model, to show the ratio of costs to sales as indicated in the study. It is designed to provide yardsticks to profit based on four separate annual sales volume levels — 10,000, 14,000, 18,000 and 22,000 tons.

**It is figured on average costs for physical plant, materials, and labor, and indicates what margin over costs is necessary to cover the many elements involved in keeping a company solvent—profits, compensation, and adequate depreciation allowances to provide for replacement.**

Certainly no such working model can be considered final and perfect. Adjustments must be made to fit the particular circumstances, but it is the best currently available.

Sporadic profits in an industry as basic as plant foods are an enigma. There is plenty of evidence that the fertilizer business is here to stay and to grow. Consider these facts:

1. The comparison of fertilizer industry's expected growth with that of the national economy, as represented by the Gross National Product. The industry has projected growth at the rate of 5.3% for the period through 1974, compared with 4.4% for the Gross National Product.

2. The population growth, both in this country and throughout the world.

3. The trend toward fewer farms and scarcer farm labor, meaning that more fertilizer will have to be used to get the needed productivity from each acre.

4. Continuous depletion of the soil by successive harvests; the nutrients that crops have extracted must be replaced.

Despite these positive signs, the industry presents a hang-dog image through company failures, willingness to reduce inventories at any cost, and other signs of instability.

Three major reasons would seem to lie behind the failure of fertilizer companies. They are:

1. Faulty cost-sales ratio, as previously explained. This usually involves failure to check on costs, or failure to realize that any calculated total costs must take into account depreciation and management compensation in addition to out-of-pocket operating costs. Sales must cover these and also provide a fair return on total investment (fixed assets plus working capital). Failure to provide a reserve for emergency, or for depreciation, can lead to forced borrowing at usurious terms dictated by the lender, or to being swallowed up by another company.

**2. Over-optimism during the high-volume season, without regard to the long dry spell ahead. Credit sales constitute an estimated 80% of plant food industry sales to farmers, and sound policy is required. It is also essential to resist the pressures to go overboard on discounts in post-season settlements of accounts. The operator must also realize the full effect of his long wait for cash—until harvest time or longer.**

3. Recklessly liquidating inventories at season's end without regard for costs, and otherwise generally ignoring costs in pricing the product.

With all the factors the plant food industry has in its favor, it is an odd commentary that there are operators needlessly putting themselves out of business in these three ways. The antidote is to understand the cost-to-sales ratio, and to make corrections where it is faulty.

A beginning step is a study of the ratios contained in the working-model financial statement of the hypothetical Indiana Fertilizer Co., and a comparison of them with the figures of the individual company.

A wide discrepancy between the two (after adjusting for regional differences) is an indication of trouble—and an invitation to take corrective measures.

### Profit-Loss Explanation

TOTAL COST for the minimum-facility hypothetical plant, including granulation, amounts to $375,000. This would handle annual sales volumes of 10,000 and 14,000 tons. For larger volumes of 18,000 and 22,000 tons, additional equipment and bulkheads would be needed, bringing the total cost to $400,000.

Depreciation allowances (which must be provided to stay in business) would total $20,800 annually for the $375,000 facility and $22,300 for the $400,000 facility.

The entire sales volume will be in mixed fertilizers, and bagged.

### Investment Requirements

For many plants of this type, the common investment-to-sales ratio is 1-to-1. This means that, annually, the total investment (in both fixed and working capital) is usually about equal to the total net sales figure.

Also, the cost of sales is usually about 90% of the total net sales figure.

**Based on these common relationships, and for purposes of establishing a starting point for this illustration, the "normal" sales figure (100%) from the "normal"**

Turn to STATISTICS page 8

**TABLE 1**

| | Annual sales volume in tons | | | |
|---|---|---|---|---|
| | 10,000 | 14,000 | 18,000 | 22,000 |
| Normal cost of sales (90%) | $535,400 | $730,100 | $ 930,500 | $1,128,200 |
| Normal sales, therefore (100%) | $595,000 | $811,200 | $1,033,900 | $1,253,600 |
| Normal investment, $-for-$ | $595,000 | $811,200 | $1,033,900 | $1,253,600 |
| Physical plant facility | $375,000 | $375,000 | $ 400,000 | $ 400,000 |
| Working capital (balance) | $220,000 | $436,200 | $ 633,900 | $ 853,600 |
| | $595,000 | $811,200 | $1,033,900 | $1,253,600 |
| Sales-to-total investment ratio | 1-to-1 | 1-to-1 | 1-to-1 | 1-to-1 |
| Physical plant % of investment | 63% | 46% | 39% | 32% |
| Working capital % of investment | 37% | 54% | 61% | 68% |

**TABLE 2**

| | Annual sales volume in tons | | | |
|---|---|---|---|---|
| | 10,000 | 14,000 | 18,000 | 22,000 |
| Normal investment (Table 1) | $595,000 | $811,200 | $1,033,900 | $1,253,600 |
| 5% Net return (after taxes) | $ 29,800 | $ 40,600 | $ 51,700 | $ 62,700 |

**TABLE 3**

**"INDIANA FERTILIZER COMPANY"**
**PROFIT AND LOSS STATEMENT FOR A 5% NET RETURN ON TOTAL INVESTMENT**

**Hypothetical Minimum-Facility, Dry-Mix Plant With Granulation**
**Assuming All Mixed Fertilizer Sales (Bagged)**
**(In Dollars)**

| | Annual sales volume level in tons | | | |
|---|---|---|---|---|
| | 10,000 | 14,000 | 18,000 | 22,000 |
| Net sales | $619,000 | $847,900 | $1,080,400 | $1,309,000 |
| **Composite selling price per ton** | **($62.00)** | **($60.55)** | **($60.00)** | **($59.50)** |
| Dollar amounts: | | | | |
| NET SALES | $619,900 | $847,900 | $1,080,400 | $1,309,000 |
| COST OF SALES | | | | |
| Material (including bags) | $440,000 | $616,000 | $ 792,000 | $ 968,000 |
| Direct labor | $ 22,500 | $ 31,500 | $ 40,500 | $ 49,500 |
| Overhead | | | | |
| Supervision and indirect labor | $ 28,900 | $ 31,100 | $ 37,500 | $ 42,800 |
| Depreciation, repairs and maint. | 27,800 | 28,800 | 31,300 | 32,300 |
| Heat, light and power | 6,000 | 8,400 | 10,800 | 13,200 |
| Insurance and taxes | 6,000 | 8,400 | 10,800 | 13,200 |
| Supplies and miscellaneous | 4,000 | 5,600 | 7,200 | 8,800 |
| Total overhead | $ 72,700 | $ 82,300 | $ 97,600 | $ 110,300 |
| Total cost of sales | $535,200 | $729,800 | $ 930,100 | $1,127,800 |
| **Gross margin per ton** | **($8.45)** | **($8.45)** | **($8.35)** | **($8.25)** |
| GROSS MARGIN (PROFIT) | $ 84,700 | $118,100 | $ 150,300 | $ 181,200 |
| Selling, general and administrative | 34,100 | 45,000 | 54,000 | 62,000 |
| Profit before taxes | $ 50,600 | $ 73,100 | $ 96,300 | $ 119,200 |
| Federal income taxes | 20,800 | 32,500 | 44,600 | 56,500 |
| **Net margin per ton** | **($3.00)** | **($2.90)** | **($2.85)** | **($2.85)** |
| NET MARGIN (PROFIT) | $ 29,800 | $ 40,600 | $ 51,700 | $ 62,700 |

NOTE: These dollar amounts represent a 4.80% net profit on sales, which is equivalent to a 5.00% net return on total investment.

**TABLE 4**

**"INDIANA FERTILIZER COMPANY"**
**PROFIT AND LOSS STATEMENT FOR A 5% NET RETURN ON TOTAL INVESTMENT**

**Hypothetical Minimum-Facility, Dry-Mix Plant With Granulation**
**Assuming All Mixed Fertilizer Sales (Bagged)**
**(In %-to-Sales Ratios)**

| | Annual sales volume level in tons | | | |
|---|---|---|---|---|
| | 10,000 | 14,000 | 18,000 | 22,000 |
| Net sales | $619,900 | $847,900 | $1,080,400 | $1,309,000 |
| **Composite selling price per ton** | **($62.00)** | **($60.55)** | **($60.00)** | **($59.50)** |
| %-to-Sales ratios: | | | | |
| NET SALES | 100.00% | 100.00% | 100.00% | 100.00% |
| COST OF SALES | | | | |
| Material (including bags) | 70.98% | 72.65% | 73.31% | 73.95% |
| Direct labor | 3.63% | 3.71% | 3.75% | 3.78% |
| Overhead | | | | |
| Supervision and indirect labor | 4.66% | 3.67% | 3.47% | 3.27% |
| Depreciation, repairs and maint. | 4.48 | 3.40 | 2.90 | 2.46 |
| Heat, light and power | .97 | .99 | 1.00 | 1.01 |
| Insurance and taxes | .97 | .99 | 1.00 | 1.01 |
| Supplies and miscellaneous | .65 | .66 | .66 | .67 |
| Total overhead | 11.73% | 9.71% | 9.03% | 8.42% |
| Total cost of sales | 86.34% | 86.07% | 86.09% | 86.15% |
| **Gross margin per ton (in dollars)** | **($8.45)** | **($8.45)** | **($8.35)** | **($8.25)** |
| GROSS MARGIN (PROFIT)—%-to-sales | 13.66% | 13.93% | 13.91% | 13.85% |
| Selling, general and administrative | 5.50% | 5.30% | 5.00% | 4.74% |
| Profit before taxes | 8.16% | 8.63% | 8.91% | 9.11% |
| Federal income taxes | 3.36% | 3.83% | 4.11% | 4.31% |
| **Net margin per ton (in dollars)** | **($3.00)** | **($2.90)** | **($2.85)** | **($2.85)** |
| NET MARGIN (PROFIT)—%-to-sales | 4.80% | 4.80% | 4.80% | 4.80% |

NOTE: This 4.80% net profit on sales is equivalent (in dollars) to a 5.00% net return on total investment.

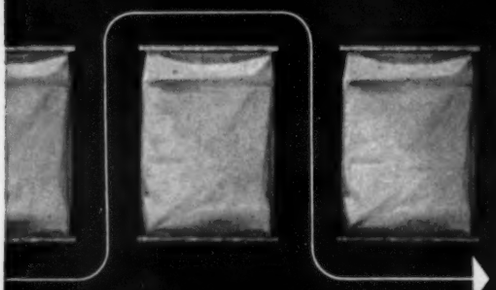
## EDITOR'S NOTE

**How can the individual fertilizer manufacturer know whether his profit and cost picture compares favorably or unfavorably with others in the industry?**

**Obviously, he needs some kind of yardstick that is unavailable at present. This article presents perhaps the first guide toward development of such a yardstick for the plant food business—a sample set of ratios developed from a practical study of representative fertilizer operations in one important geographical area.**

**Information was gathered and the ratios developed as a result of discussions of this problem at meetings of the Customer Advisory Panel sponsored by International Minerals & Chemical Corp. The survey and the working-model profit and loss statement are regarded as a "beginning step" toward profit improvement for the industry.**

*in the last two years over 210 multiwall users cut their packaging costs through a UNION-CAMP*



# PLANT SURVEY

*another FREE service of the 5 Star Packaging Efficiency Plan!*

UNION-CAMP's 5-Star Plan has helped over 210 firms reduce their materials handling costs within the last two years alone. The economies resulted directly from a single service feature of the plan . . . a plant survey.

One survey, made for a midwest packer, speeded his multiwall handling operation by 50 per cent. Another company, by following UNION-CAMP recommendations, released labor for more productive functions and saved $37,584. A third multiwall user lowered his costs by nearly $50,000 a year. And there are many more such success stories.

A UNION-CAMP multiwall specialist will be glad to review your present operation . . . show you how the 5-Star Plan can help produce more economical, more efficient control. The plan also covers bag design, bag construction, specifications control and packaging machinery. It's yours without cost or obligation.

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★ BAG DESIGN · BAG CONSTRUCTION · SPECIFICATIONS CONTROL · PACKAGING MACHINERY · PLANT SURVEY

IN PRODUCTION—Start of operation was begun recently at the new ammonium phosphate and wet process phosphoric acid plant of the Valley Nitrogen Products, Inc., at Helm, Cal. Using the latest plant-run acid Carlile process, this plant has a capacity of approximately 75,000 tons a year of ammonium phosphate and complex fertilizers and 16,500 tons per year of $P_2O_5$ (wet process phosphoric acid.) Engineering of the plant was performed by the J. C. Carlile Corp. of Denver, Colo.

## Plants Honored for Perfect Safety Records

RICHMOND, VA. — Twenty-one fertilizer manufacturing plants and one analytical laboratory of Virginia-Carolina Chemical Corp. were awarded certificates of achievement by the Manufacturing Chemists' Assn. for having completed a full calendar year of operation without lost time accidents.

Plants receiving the award are located at Remington, Ind.; Nichols, Fla.; Estherville, Iowa; Baltimore, Md.; Athens, Ga.; Durham, N.C.; North Little Rock, Ark.; Cincinnati, Ohio; Selma, N.C.; Orrville, Ohio; Jacksonville, Fla.; Rochester, N.Y.; Lynchburg, Va.; Charlotte, N.C.; Charleston, S.C.; Savannah, Ga.; Montgomery, Ala.; Jackson, Miss.; Greenville, S.C.; Mt. Pleasant, Tenn.; Portsmouth, Va., and Analytical Laboratory, Richmond, Va.

## Additive in Water Gives More Control In Fighting Fires

SYRACUSE, N.Y.—Chemicals that transform water into a fluid that snuffs out fire 10 times faster than ordinary water are being evaluated by Syracuse University scientists.

Dr. C. S. Grove of Syracuse told a meeting of the National Fire Protection Assn. in Montreal May 17, that improving water's fire-fighting qualities may be the best way of curbing fire's tremendous destruction of life and property.

Dr. Grove is director of engineering research at the university's research institute.

He said the institute's scientists, in 14 years of studying various fire-extinguishing agents, have come to believe that some of the better qualities of fire-fighting foams—high viscosity and blanketing ability—can be transferred to water.

Water, always the cheapest and most abundant and often the only fire-fighter available, nevertheless has some drawbacks, Dr. Grove pointed out.

Its low viscosity, which limits its blanketing ability and allows it to evaporate quickly and run off burning structures, is its major shortcoming. The scientists thus have been concentrating on chemicals which improve water, mainly viscosity additives.

Such additives thicken water to a consistency similar to that of milk, and just that amount of variation gives the water greatly improved blanketing and run-off properties, Dr. Grove said.

A number of viscosity additives have been tested by the researchers, including opacifiers, detergents, and a water-soluble polymer. The latter, a product of Dow Chemical Co. has shown unusual effectiveness, according to the research reports. It is a developmental product known as ET 460-4.

The scientists say they believe it can be used in conventional fire-fighting equipment with slight modification of the pressure-boosting pumps on fire trucks.

The opacifiers used will make water more opaque, which enables it to reflect the radiant energy of flames away from the burning structure, Dr. Grove said. Detergents disperse opacifier particles in suspension and help the fluid spread over the burning surface.

## Virginia-Carolina Installs Odor-Reducing Equipment

CHARLESTON, S.C.—According to W. K. Enos, general superintendent, new equipment expected to correct objectionable odors has been placed in operation at the Virginia-Carolina Chemical Co.'s plant here.

"The equipment is especially designed to reduce smells which accompany the production of cotton defoliant," Mr. Enos explained. "Complaints from north area residents last year prompted V-C to halt production in order to conduct research on corrective methods."

Although the plant is not in full operation yet, Mr. Enos said he is confident that it will prove satisfactory.

"As insurance against further annoyance to its neighbors, the Charleston plant has set up patrols by technical personnel who will check the area on a 24-hour basis," he added.

### INCOME RISES

NORFOLK, VA.—Net sales of $40,337,557 and net income of $2,973,761 for the nine-month period ending April 30, 1960, were reported by the Smith-Douglass Co. This compares with sales of $35,364,539 and net income of $2,341,936 for the same period last year.


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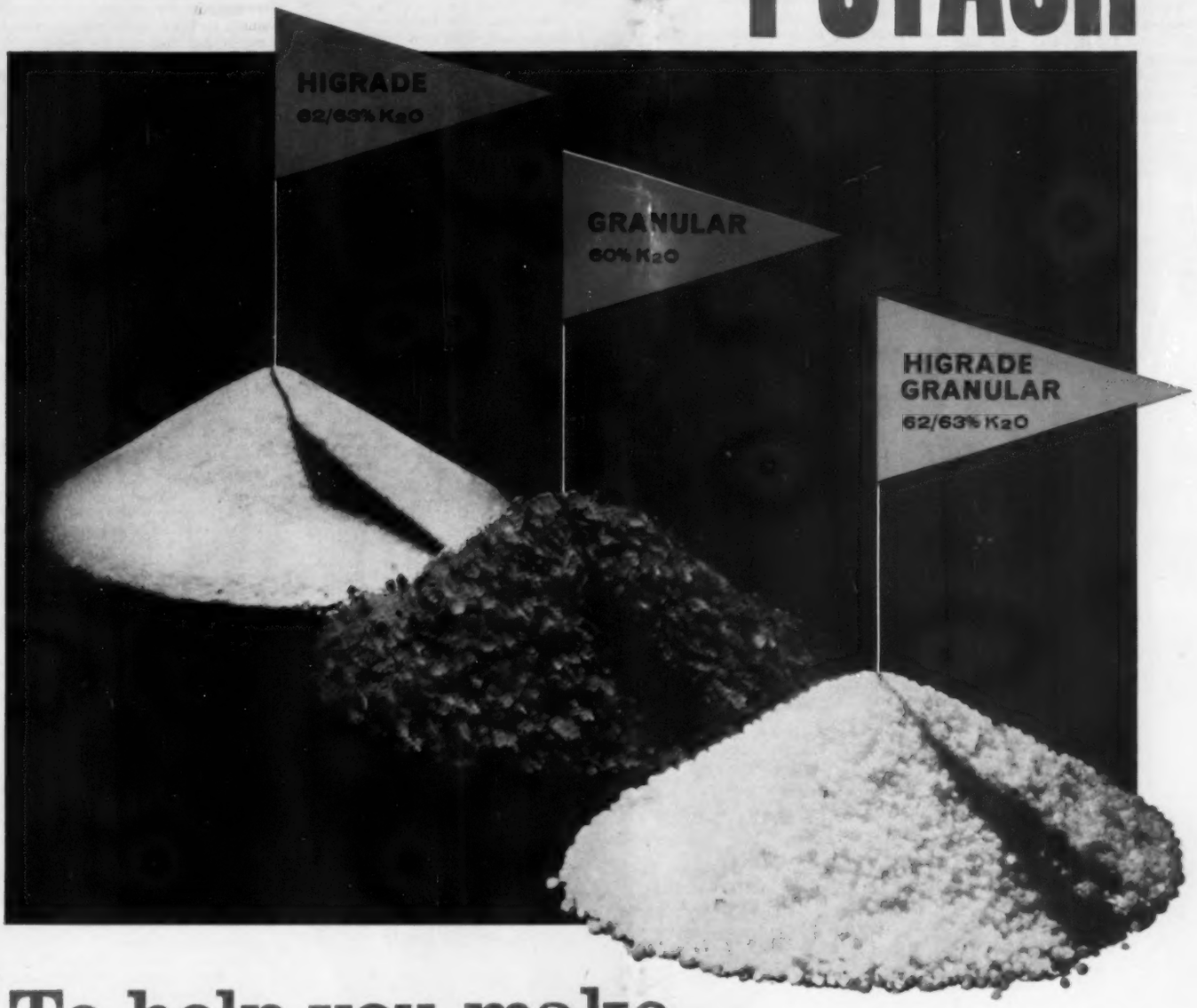


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# STATISTICS

Continued from page 4

**cost of sales figure (90%) are computed in table 1.**

(It should be noted that since the investment in the physical plant facility is fixed, the balance of the investment required for working capital gradually increases as the sales volume increases.)

### What Is A Fair Return?

With "total investment" defined, and normal total investment requirements computed, the question arises: "What is a fair return on total investment?"

First, the return must be the net profit after taxes. (The government, in effect, is a partner in the business.)

Second, the rate must be figured on total annual investment, not just out-of-pocket investment.

Third, the rate of return certainly should be somewhat better than the net return from interest earned in the money market. This is difficult with the keen competition and narrow margins so common in the fertilizer business.

Thus a 5% net return after taxes would seem to be fair and reasonable —and one that can be realized from sales at reasonable prices.

To develop the composite per-ton sales price required to secure this 5% return, the "normal" annual investment required was used as computed in table 1. Thus, 5% of this figure becomes the base for developing the required sales price as shown in table 2.

### What Ratios Must Be Kept?

A complete but condensed exhibit (the working model profit-and-loss statement) for the hypothetical plant operating under standardized conditions at the 4 sales volume levels is presented in two forms — in Dollar Amounts (table 3) and in %-to-Sales Ratios (table 4).

With the fertilizer man in mind, the equivalent "per ton" amount has been set in boldface type for only the three key figures—Composite Selling Price, Gross Margin, and Net Margin. (These are composite per ton figures for all sales. Naturally, some grades will be above, some below.)

### Explanation of Terms

Net Sales, the top figure in the exhibit, is the final figure arrived at in the calculations. It was developed from the Net Profit After Taxes base, which is identical (in dollars) to the 5% Net Return on Total Investment shown for each volume level in table 2.

Material is standardized at $44 per ton at all levels (assuming normal distribution of sales and normal incoming freight costs for this locality). It includes $3 per ton for bag costs; sales in bulk form would cost less, but would also sell for less.

Direct Labor is standardized at $2.25 per ton at all levels. (This is not the per hour figure.)

Overhead is made up of the items indicated, partly fixed and partly variable, as follows:

**Supervision** includes the basic staff—a manager (superintendent), a general foreman, and a factory clerk. Provision is made for either higher-priced men or additional help at the higher volume levels.

**Indirect Labor** includes clean-up, rehandling materials, premium time, holidays, and associated payroll costs such as F.I.C.A., S.U.I., W/C, and P/L. These are computed at 10% of the total payrolls for supervision, direct labor, and indirect labor

**Depreciation**, as explained under the investment section, is allowed at $20,800 at the two lower levels, and $22,300 at the two higher levels. These are composite depreciation allowances, based on a planned service life of 30 years for buildings and 15 years for equipment. Repairs and maintenance would average about $7,000 per year for the first 10 years (not including any capitalized replacements). Nominal amounts were added for this latter cost at the higher volume levels.

**Heat, Light & Power** is figured at 60¢ a ton.

**Insurance & Taxes** is also figured at 60¢ a ton.

**Supplies & Miscellaneous** is figured at 40¢ a ton.

Cost of Goods Sold is the total of material, direct labor, and overhead at each level. (The most substantial saving is made at the second volume level. This indicates that a minimum-facility plant would be under a constant strain to maintain profitable ratios at an annual volume as low as 10,000 tons.)

Gross Profit, of course, is net sales minus cost of sales.

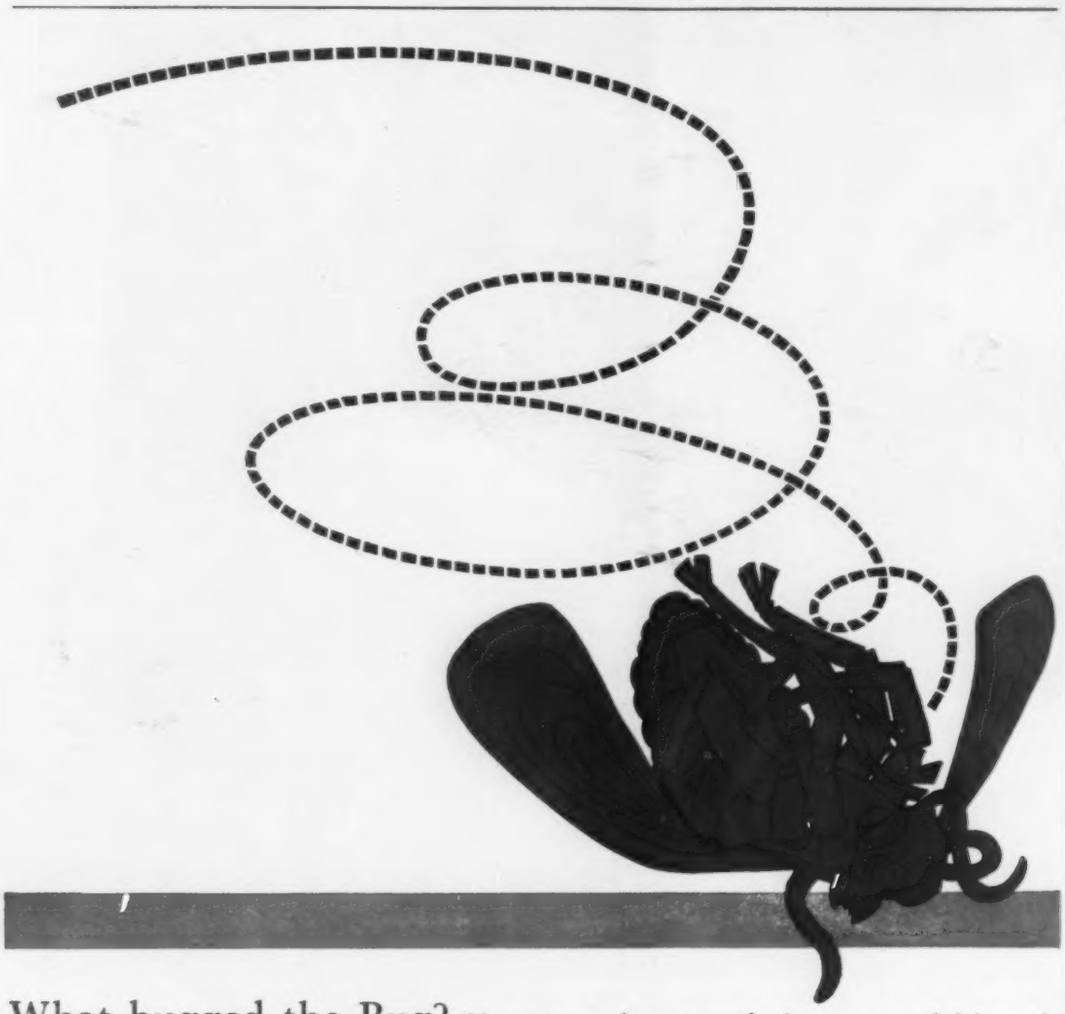
Selling, General & Administrative includes a salary for the owner arbitrarily set at $15,000 at all levels. This assumes that the owner and his supervisory staff (with their personal following and walk-in business) do all of the selling at the 10,000 ton level. An extra outside salesman has been added for each additional 4,000 tons, at a "total cost package" for each salesman of $8,000. Additional clerical help is included at the higher volume levels, and a nominal amount for additional costs such as advertising, auditing, and office supplies.

Federal Income Taxes are calculated at the regular corporate rates. State income taxes have not been considered, since not all states have taxes of this type.

Net Margin is equivalent to net profit after taxes. Note that this %-to-sales ratio runs slightly under 5% (about 4.80%). This is because the "required sales price" (as developed) turned out to be slightly higher than the "normal" sales established in table 1 and used, in turn, for developing the "normal" investment. In each case, however, the 4.8% net margin on sales is equivalent in dollars to the 5% net return on total investment.

## Featured Speaker

WASHINGTON — John M. Curtis, agricultural marketing specialist, North Carolina State College, will be the featured speaker at the Delmarva Peninsula Fertilizer Assn. convention June 25, at the George Washington Hotel in Ocean City, Md.

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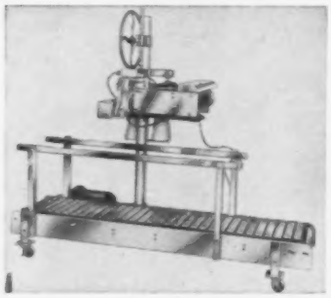
# What's New?

**Additional information is available about new products, new services, and literature described in this department. Circle the numbers of items on which you desire more information, fill in your name, your job title, your company's name and address on the card. Then clip it out of the page and mail. No postage is necessary.**

## No. 9208—Bag Closing Machine

The Minneapolis Sewing Machine Co. recently introduced an automatic bag closing machine, conveyor Model ASC-100. Once the bag is filled, it is automatically conveyed through the bag feeder, where it trips the automatic starter for the sewing head. After the bag is sewn, the sewing head stops automatically. Threads are



cut both front and back of the closure by the automatic thread clipper. The machine effects a saving in time and labor and eliminates excessive thread waste and wear on the sewing head, report company officials. The unit is 7 ft. long, 5 ft., 6 in. high and 29 in. wide. The conveyor has a speed of 32 ft. per min. The conveyor is mounted on castors for easy portability. The conveyor model is also available without the automatic attachments for those preferring manual operation. Minneapolis automatic attachments can be adapted to any Minneapolis conveyor model now in use. For more information, check No. 9208 on the coupon and mail.

## No. 9213—Handling, Storage Bulletins

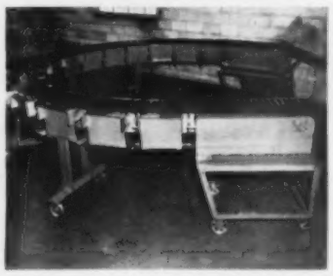
Monsanto Chemical Co. announces the publication of three technical bulletins covering the bulk handling and storage of sulfuric acid and oleum (I-182). The illustrated bulletins are designed to give technical assistance in setting up safe procedures in the bulk unloading, handling and storage of the materials. Each publication covers shipments, tank car dome fittings, tank truck pipe fittings, factors to consider in determining storage tank sizes, construction materials, level indication, tank car and tank truck unloading methods, product sampling and safety factors. For copies, check No. 9213 on the coupon and mail.

## No. 9211—Dispersants, Adjuvants Bulletin

A bulletin containing information about CPG dispersant-adjuvant is available from Colloidal Products Corp. The bulletin contains general information on the development of CPG and data on use with fertilizer and pesticide solutions. Copies of the bulletin can be obtained by checking No. 9211 on the coupon and mailing to this publication.

## No. 9214—Conveyor

The R. T. Sheehan Co. announces a basic "Flex-Bend" conveyor with hinged receiving plate. It comes in 12 in. and 18 in. metal belt widths, running 42 in. above the floor. The unit bends horizontally on a 5 ft. and 6 ft. inside belt radius. The flexible metal belt comes in six gauge high carbon steel wire and is carried and guided by sealed grease-packed ball



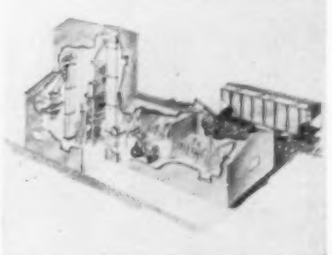
bearing rolls. Optional extras include power traveler attachments for each end, power stacker for bag stacking and reversing metal belt travel. It can be used for box car loading and unloading, warehousing and general plant use. For information, check No. 9214 on the coupon and mail.

## No. 9210—Dust Filter Bulletin

An eight-page bulletin containing detailed information about the "RJ" dust filter manufactured by the Day Co., has been released. The bulletin describes how the filter, with only three moving parts, filters and recovers dust from airstreams lightly or heavily loaded with fine, coarse, abrasive or non-abrasive dusts. Included are details about the company's method of maintaining porosity of the filtering media. Specifications and dimensions of single and multiple installations are given for standard fan locations and reverse air pressure blowers. Photos show construction details and typical installations. For copies, check No. 9210 on the coupon and mail.

## No. 9209—Fertilizer Plants

A series of package plants for blending and mixing bulk fertilizer has been introduced by Midstate Machinery Co. Designed for low-cost installation in any simple steel or frame building, the pre-engineered plants are furnished complete with equipment, detailed assembly plans and a choice of floor-plans to fit the buyer's building and operating requirements. Construction can be handled by the purchaser or by Midstate. The smallest plant is designed for one man op-



eration and utilizes a minimum of equipment to produce 15 tons an hour of mixed and blended fertilizer. A larger version boosts capacity to 30 tons an hour. A complete brochure is available. Check No. 9209 on the coupon and mail.

## No. 9207—Tractor Shovels

Series B models of the H-70 and H-90 "Payloader" tractor-shovels "offer numerous improvements which increase production and better the performance of these four-wheel-drive units," according to the manufacturer, the Frank G. Hough Co. While operating capacity of the H-90 series B unit remains at 9,000 lb., the peak lift has been increased to 18,000 lb. This model now has a longer wheelbase and wider tread, along with greater machine weight. Additional power is provided by a new Cummins Turbo-charged diesel engine which develops 162 h.p. at 2,100 rpm. A GMC diesel, which develops 153 h.p. at 2,200 rpm. is offered as an option. Major improvements in the full power-shift transmission and the torque-converter have been made, according to the manufacturer. The standard tire size of the H-90 series B machine has been increased and the front axle, main frame and other structural parts have been strengthened. New air brakes are standard on the H-90 and both the H-90 and the H-70 series B units have the dual foot brake pedals. The H-70 retains the same recommended operating capacity of 7,000 lb., but the peak lift has been increased to 13,000 lb. Improvements have been made in the boom arm design and bucket control link-

age. More power is provided by a larger Cummins diesel engine with optional power including an IHC gas engine and a GMC diesel. The capacity of the hydraulic reservoir has been increased. For details, check No. 9207 on the coupon and mail.

## No. 9206—Nitrogen Analyzer

A nitrogen analyzer has been developed by Coleman Instruments, Inc. According to the company, the unit combines modern automation with

the classic Dumas method of measuring nitrogen. The instrument performs the procedure virtually by itself and takes up only 18 in. of bench space, the company says. To operate, the chemist prepares the sample and sets the timing controls. The analyzer preheats and burns the sample, collects the nitrogen, measures it and the operator can read the nitrogen content in cubic centimeters on a dial. For details, check No. 9206 on the coupon and mail.

## No. 9212—Handbook on Belting

A new handbook on solid woven cotton belting is available from Woven Fabric Belting Manufacturers Assn. The manual gives the standards, characteristics and applications for untreated belting, synthetic rubber impregnated belting and wax or bituminous impregnated belting. Suggestions for better belt care, which, if followed, will result in longer life of belting, are also included. For copies, check No. 9212 on the coupon and mail.

---

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- ☐ No. 9207—Tractor Shovels
- ☐ No. 9208—Bag Closing
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- ☐ No. 9210—Dust Filter Bulletin
- ☐ No. 9211—Dispersants, Adjuvants Bulletin
- ☐ No. 9212—Handbook on Belting
- ☐ No. 9213—Handling, Storage Bulletins
- ☐ No. 9214—Conveyor

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- Eliminates fire hazard • 100% organic
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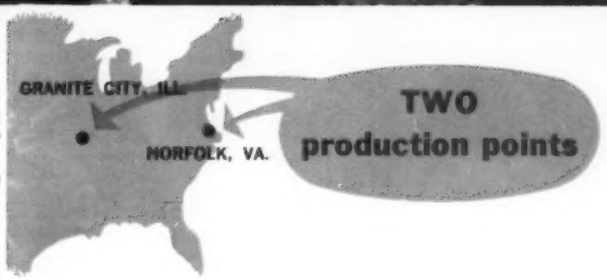


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**LIQUID AFLOAT—Dr. John L. Strauss, vice president, Ris-Van, Inc., Belmond, Iowa, Division of Stepan Chemical Co., tests mixed liquid fertilizer shipped by barge to Dubuque, Iowa, on the Mississippi River. The barge, a new one owned by Commercial Transport Corp. of Texas, was loaded with 1,200 tons 11-33-0 at Wilson Dam, Ala., and moved via inland waterways to the Iowa point where its contents were unloaded and stored by the Dubuque Tank Chemical Co. for Ris-Van. The liquid fertilizer is being trucked to four of the six manufacturing plants operated by Ris-Van, where it will be used as a raw material for production of high analysis fertilizers.**

# Key Role for Mill Seen in Pesticide Plant's Output Rise

Use of a new-type of pulverizing mill for manufacturing various pesticidal products has enabled Quality Chemical Corp., Wilson, N.C., to increase the number of products formulated directly by the firm, it reports. Of the 100 insecticides, fungicides, fumigants, defoliants, preservatives and miscellaneous chemicals offered by the company, 67 are now formulated by the company itself.

Quality Chemical tested the mill under commercial conditions for a year for pulverizing DDT, aldrin, TDE, dieldrin, endrin, BHC, chlordane and other insecticides and fungicides. Results were good, according to reports by both Quality and the Sturtevant Mill Co., Boston, Mass., maker of the equipment.

The 24" mill operates on 40 horsepower on an eight-hour daily shift and handles about a ton an hour of various fungicides and insecticides.

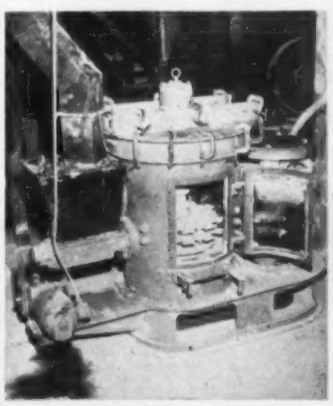
The pesticide plant introduces predetermined proportions of toxicant and clay into an elevator which conveys the ingredients to a ribbon blender which mixes them prior to pulverization, and discharges directly into the variable rate screw feeders of the mill.

A description of the equipment says that vanes within the mill create a whirling vertical air flow which pulls the ingredients into the pulverizing zone where revolving impactors crash them against stationary wall impactors. This double impactor action, combined with attrition of particles against the housing walls, performs thorough pulverization.

Sturtevant-designed deflector wall construction returns oversize particles to the grinding zone while an exhaust fan sucks the other fines upward through the revolving centrifugal selector arms which guard against oversize a second time, allowing only particles of desired fineness to be blown to the dust collector. Particle size is controlled by the number of selector bars employed, the feed rate and vertical air flow. Quality uses from six to twelve bars on various products.

The whirling air flow principle has a cooling effect on the material being ground and makes possible the effective reduction even of some heat-sensitive materials. (For materials that are extremely heat-sensitive, refrigerated air can be introduced.)

Although not part of the Quality installation, mill can employ inert gases for air flow if required. The makers offer a replaceable interior rubber liner on units grinding materials that have a tendency to adhere to steel.



**SUCCESSFUL MILL—Mill at Quality Chemical Corp., Wilson, N.C., which operates 8 hours a day for manufacture of various insecticides, fungicides, defoliants, other pesticidal chemicals. Mill door opens for inspection.**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DUST — For Insecticide Carriers, Diluents

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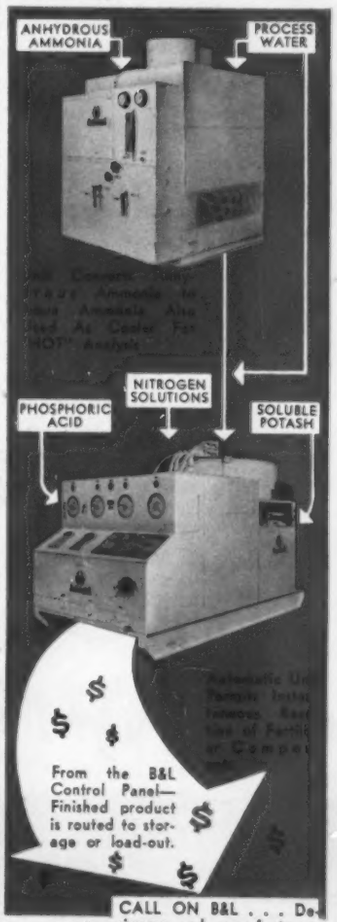


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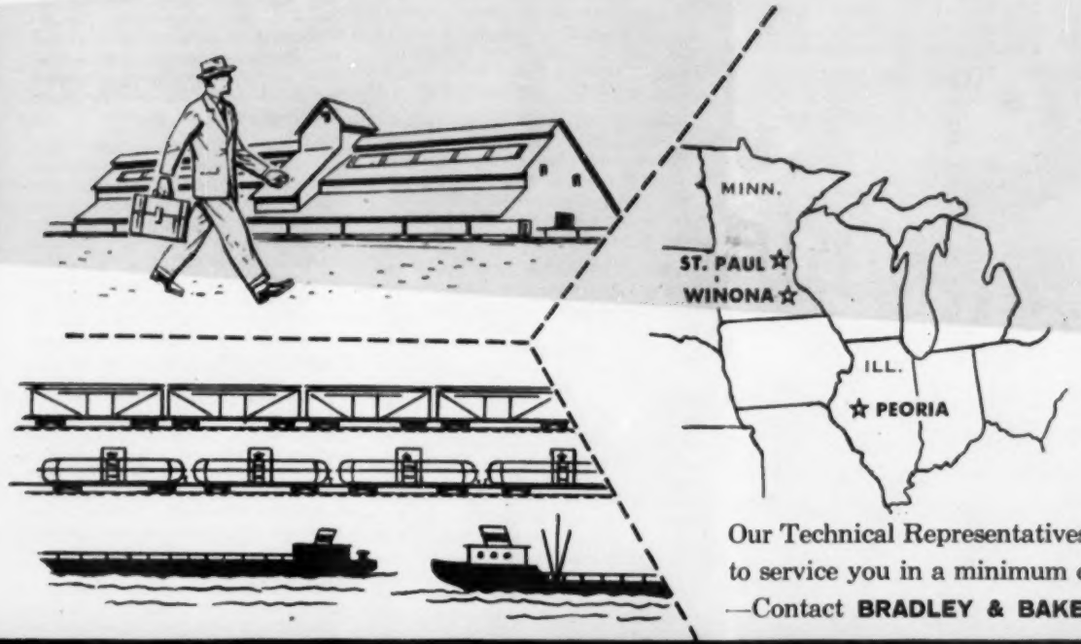


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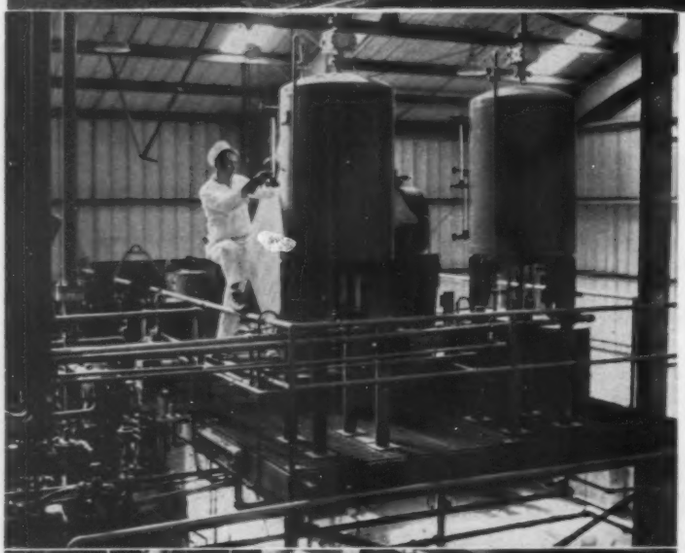
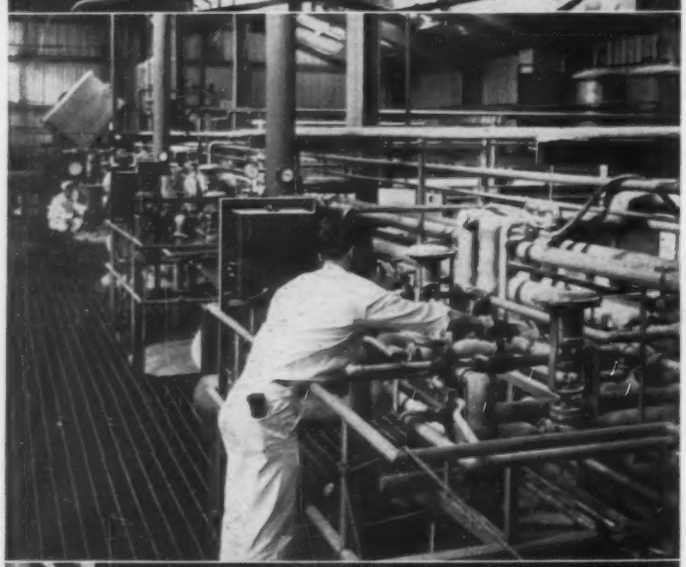
**MODERN PESTICIDE PLANT—At left, aerial view of Chemagro Corp. plant at Kansas City, Mo. Site includes not only modern pesticide production facilities, but also headquarters for administration, research and sales activities. Plant produces organic phosphate insecticides, fungicides, defoliants, and herbicides. It was designed by engineering department of Farbenfabriken Bayer, of which Chemagro is an affiliate.**





**Kansas City Locale . . .**

# A Look at Chemagro's Modern Pesticide Plant

CHEMAGRO CORP.'s new manufacturing plant at Kansas City, Mo., is now in full operation manufacturing agricultural chemical products through all stages from raw materials to finished product.

Said to be the only company in the U.S. and one of the few in the world devoted exclusively to the development and manufacture of chemicals for agriculture, the firm is an affiliate of Farbenfabriken Bayer, A.G., of Leverkusen, West Germany, and Pittsburgh Coke & Chemical Co., Pittsburgh, Pa.

The plant includes specially engineered manufacturing facilities, many of which are completely automated. It also is headquarters for the company's administration, research and sales activities. Its pesticidal products are distributed to all parts of the U.S. and Canada. These include organic phosphate insecticides, fungicides, defoliants, and herbicides.

**Dr. Robert C. Scott, vice president-manufacturing, emphasizes the plant's versatility as an important feature, stating that the various units were designed with flexibility providing for production of different types of products per unit.**

Chemagro makes both liquid and dust products and thus operates two formulation units. These include milling, blending and packaging equipment units to produce a variety of products.

The plant employs many precautionary procedures. Before commercial manufacturing is begun, procedures are tested and established in the process development laboratories and then in the company's pilot plant. When finally in production, materials move from one production step to another through color-coded pipes, ducts and conveyors. Temperatures, pressures, and blending times are controlled automatically. Samples are taken from each production batch and tested by the analytical control section of the research department.

**In addition to manufacturing commercial products, Chemagro makes most of its own technical materials. These are moved through various processes, involving the use of reaction vessels, extensive condensing equipment, extraction and separation units, and scrubbers and dryers. They are then piped to the formulating plant.**

A comprehensive safety program has been set up at Chemagro, and is well organized and equipped. Safety showers are located outside every laboratory and eye wash stations are strategically located. Fire blankets, fire extinguishers and stretchers are available in every department.

**An emergency squad, composed of personnel from every department, undergoes continuous training. Equipment used by the squad, including all-purpose gas masks, self-contained breathing apparatus and resuscitators, is centrally located for easy accessibility. In addition, the plant is equipped with a fire sprinkling system and a custom designed ventilating system which changes the air in plant buildings every six minutes.**

The company places much emphasis on development of new products, with ten being field tested at present.

H. F. Tomasek, president, points out that at least 90% of all farm chemicals in use today were not even available 15 years ago. "Still," he says, "we are seeking better soil fungicides, improved seed treatment chemicals, and feed additives, and we are searching for more effective compounds to control nematodes."

The research department is equipped with the latest scientific equipment for chemical, biochemical and biological study and evaluation, and covers a broad field of activities.

The company produces and markets a broad variety of products. Chemagro introduced "Systox", first systemic insecticide to be approved for use on food crops for control of aphids, mites and leaf hoppers.

Other Chemagro products made at Kansas City by Chemagro include: "Co-Ral", a systemic insecticide to control cattle pests; "Guthion", for fruit pests; "Dylox", to control a variety of insects on alfalfa, cabbage, cotton and sugar beets; "Dyrene", a fungus control for use on vegetables; "Di-Syston", granular insecticide for alfalfa and cotton pests, and "Def", a cotton defoliant.

**INSIDE CHEMAGRO PLANT—Scenes within Chemagro's production facilities. At left, above, charging bulk raw materials into reaction kettles. Chemagro makes most of its own technical materials. Middle picture is view of multi-colored pipes through which materials are moved from one production step to another. Instruments maintain control of each reaction. Lower shot: Chemagro officials check filling line for "Guthion." Left to right: Robert J. Foster, assistant director of manufacturing; H. F. Tomasek, president; and Dr. Robert C. Scott, vice president, manufacturing.**

# Arcadian® News

Volume 5 | For Manufacturers of Mixed Fertilizers | Number 6


## "It's a pleasure to serve you!"

**"The 1959-60 fertilizer season** has been a difficult one. Exceptionally cold weather in the Southeast delayed the start of the season in that area, and the heavy movement began in the Midwest as soon as it did in the Southeast.

"This overlapping placed a heavy strain on our tank car supply and, in spite of the fact that in the past year we spent several million dollars for additional storage, it has been difficult for us to keep up with shipments.

"Unfortunately, we must arrange for cars a year ahead of time and to make accurate estimates that long in advance is extremely difficult—especially since our estimates may be affected, as they have been this year, by weather conditions. You may be assured, however, that we will always do our best to give our customers the service they deserve.

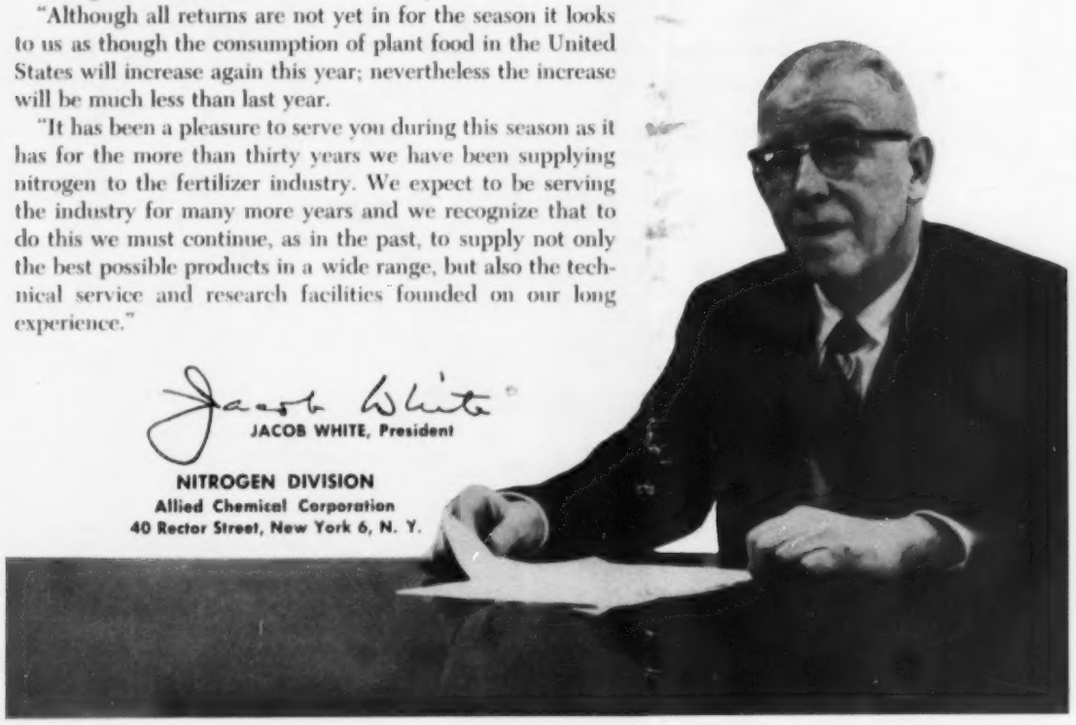
"Although all returns are not yet in for the season it looks to us as though the consumption of plant food in the United States will increase again this year; nevertheless the increase will be much less than last year.

"It has been a pleasure to serve you during this season as it has for the more than thirty years we have been supplying nitrogen to the fertilizer industry. We expect to be serving the industry for many more years and we recognize that to do this we must continue, as in the past, to supply not only the best possible products in a wide range, but also the technical service and research facilities founded on our long experience."

Jacob White

JACOB WHITE, President

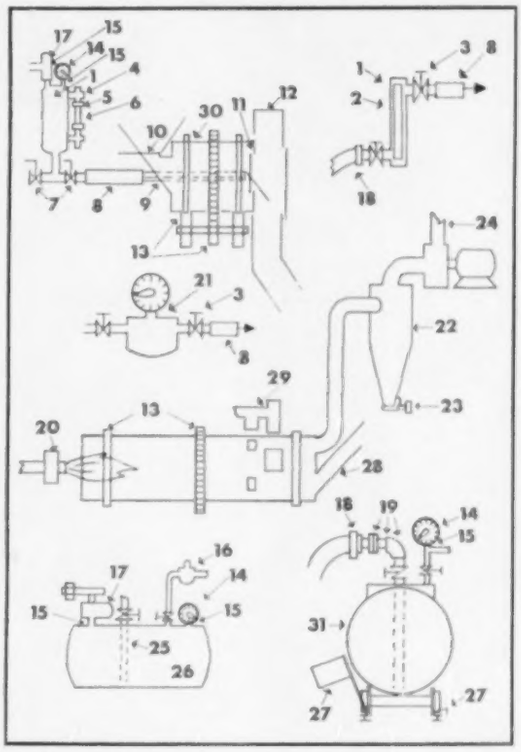
**NITROGEN DIVISION**
**Allied Chemical Corporation**
**40 Rector Street, New York 6, N. Y.**



# Handy check list for your equipment

***Here are some of the points to check to insure safe and efficient operation:***

| Action Needed | OK | |
|---|---|---|
| ☐ | ☐ | 1 Measuring tanks, rotometers – use correct specific gravities. |
| ☐ | ☐ | 2 Rotometer. Check float for wear and corrosion. Shield against breakage. Avoid mechanical strains and shocks of starting and stopping. |
| ☐ | ☐ | 3 Throttle on discharge side—to minimize vaporization of nitrogen solutions. |
| ☐ | ☐ | 4 Gauge glass connections—fittings—free for easy cleaning. Dirt here causes faulty proportioning. |
| ☐ | ☐ | 5 Extra gaskets for gauge glasses. |
| ☐ | ☐ | 6 Clean glass tubes. Make sure you have spare tubes. Add guards. |
| ☐ | ☐ | 7 Valves. Check for wear. Have spare parts on hand. Overhaul annually. |
| ☐ | ☐ | 8 Rubber hose to reduce vibrations. |
| ☐ | ☐ | 9 All distributor pipes for design and condition. |
| ☐ | ☐ | 10 Mixer inlet gate for leakage. |
| ☐ | ☐ | 11 Mixer discharge door for leakage. |
| ☐ | ☐ | 12 Rotary batch mixer. Avoid suction in mixer. |
| ☐ | ☐ | 13 Tires, trunions, ring gears and pinion for alignment, wear and safeguards. |
| ☐ | ☐ | 14 Pressure gauges—for ammonia service?—accurate? Do not let pressure continue to rise. These are not clocks. |
| ☐ | ☐ | 15 Location of gauges and safety valves on storage tanks. If connected into or near high velocity air line, they are not accurate during movement of air. |
| ☐ | ☐ | 16 Pressure regulators. They are not safety devices. |
| ☐ | ☐ | 17 Pressure and vacuum reliefs. Check operations. Remove weights unofficially added. |
| ☐ | ☐ | 18 Hose connections. Adequate stainless steel bolted clamps. Safe if loosened under pressure? |
| ☐ | ☐ | 19 Tank car connections. Stainless steel and short for strength and permanence. Use elbows to avoid hose kinks. |
| ☐ | ☐ | 20 Dryer burner—clean, adjust, and check controls. Synchronize with drying load. Question unusual demands on the dryer. |
| ☐ | ☐ | 21 Displacement meters. Lose accuracy at low rate of flow and with gas bubbles. Avoid strains and shocks. |
| ☐ | ☐ | 22 Dust collector. Check for condensation, caking, deterioration, overloading. Clean fan blades. |
| ☐ | ☐ | 23 Check for air leaks at dust collector discharge. |
| ☐ | ☐ | 24 Stacks. Check for fouling, corrosion, and build-up. |
| ☐ | ☐ | 25 Storage tank dip pipes. Check for leaks. |
| ☐ | ☐ | 26 Tanks. Check for weakening by corrosion, and failure of any coating or lining. |
| ☐ | ☐ | 27 Tank cars. Always blue flag and block wheels. |
| ☐ | ☐ | 28 Large air leaks at material inlet of countercurrent dryers severely handicap the dryer. |
| ☐ | ☐ | 29 Safeguards for hammers and other parts when working or falling off. |
| ☐ | ☐ | 30 When using acids make certain all mixing is uniform for safety and good analyses. |
| ☐ | ☐ | 31 Compare production records with shippers weight for quick check on outrun or for troubles in the process. |



**OTHER PRECAUTIONS:** Make sure operators have proper training and instruction. Equip them with rubber gloves and goggles. Have good lighting and safe exits. Keep safety literature handy. Have gas masks and a supply of water for emergencies. Emergency shower baths should be freeze-proof and warm for cold weather.

# NOW is the time to sell PASTURE FERTILIZERS

**A well-known soil scientist** says "We don't have pastures, we have playgrounds for cattle!" And there are more acres of grassland and pasture than of any other crop. Good, well-fertilized pastures can produce milk cheaper than any other source of feed. And good pastures can produce as much feed value as corn but they need as much fertilizer as corn.

June—after the first flush of spring growth is grazed off—is an ideal time to push mixed fertilizers for grass and legume pastures. Analyses, such as 16-8-8, 15-10-10, 12-12-12 and 10-10-10 are excellent fertilizers for pastures now.

Sell 12-12-12, 10-10-10 or 15-10-10 as soil builders to raise the level of phosphorus and potash in the soil. Then sell 16-8-8 to keep production at high levels by replacing the plant food as it is used.

Early summer fertilization brings on strong second growth of grass as well as legumes to keep green feed coming along through the hot months. Even when the ground gets dry, the extra growth is already there to provide grazing. Where pastures can be irrigated, summer fertilization produces a big tonnage of nutritious grazing, with up to 18 to 20% protein content.

In most states the best farmers are now applying fertilizer several times during the years—fall, early spring, and June. The better farmers apply fertilizer after each hay cutting. With irrigation or high rainfall, good farmers will apply mixed fertilizer after each grazing period. Add some customers like this and you'll be busy during the slack season. Mid-season applications of plant food are often straight nitrogen but the evidence shows that potash is more efficient if applied frequently. When you promote high-nitrogen mixed fertilizers such as 16-8-8 or 15-10-10 you provide a balanced complete program at every application.

## Technical Tips

## UREA HELPS PULVERIZED FERTILIZER PRODUCTION

**More and more producers** are discovering the advantages of the urea-ammonium nitrate-ammonia-water solution over the conventional ammonium nitrate-ammonia-water formula. Let's examine the reasons why this addition of urea is so beneficial to fertilizers.

At the outset, let us agree that the term "pulverized fertilizer" embraces only those fertilizers that are processed on a once-through basis, with no mechanical drying, and under moisture and temperature conditions that produce little or no agglomeration. In general, no or hardly any acid is used in formulation. Nitrogen solution is used to the extent of the capacity of the superphosphates to react with the free ammonia; ammonium sulphate is generally used to provide any additional nitrogen that might be desired.

### Greater Flexibility

One of the principal reasons why the urea-ammonium nitrate-ammonia-water solution is to be recommended is the greater flexibility it allows in formulation. For example, this type of solution makes it possible to have a lower percentage of free ammonia for a given nitrogen total without increasing the salting-out temperature. Also, for the same free ammonia and the same nitrogen total, the presence of urea permits a solution of much lower salting-out temperature. This could be a major advantage to mixers faced with winter temperatures and no heat.

### Improves Condition

Another reason for using a urea-added solution is the fact—backed by many case histories in the industry—that the use of a limited amount of urea in some pulverized grades results in improved condition of the product. At the very least, the use of the urea-added solution provides the mixer of such fertilizer grades with a convenient way of including urea in his formulation without the bother of storing and processing an additional raw material.

Past experience has shown several reasons for the observed improvement in product condition when a urea-added solution is used. One is the effect of urea on the crystallization of ammonium chloride. Here the urea acts to suppress the tendency of ammonium chloride to form a network of interlocking needle-like crystals which are thought to promote caking. Also, the decreased vapor pressure of fertilizer made with urea solutions reduces the degree of drying out in storage. This results in fewer crystal bridges being formed between particles, thus making a softer material.

### Increased Nitrogen Solubility

A third reason for using urea is the greater solubility of total nitrogen in the urea-added solution as compared to the ammoniating solution with the same free

(continued on following page)

(continued from preceding page)

ammonia content but without urea. It's also true that once the free ammonia in comparable solutions has been reacted in the mixer, the remaining urea-added solution has a much lower salting-out temperature than the non-urea solution. To illustrate: a solution containing 34% free ammonia, 60% ammonium nitrate and 49% total nitrogen would salt out at 212°F after the free ammonia is removed. A solution of the same total nitrogen but composed of 33% free ammonia, 45.1% ammonium nitrate and 13% urea would salt out at 117°F after removal of free ammonia. It's quite possible that this property of increased solubility could result in more uniform distribution of nitrogen on the other fertilizer solids, particularly where mixer temperatures are low.

While admitting all these benefits of using a urea-ammonium nitrate-ammonia-water solution in preference to the conventional ammonium nitrate-ammonia-water solution, dissenters point out that urea-added solutions are more hygroscopic than non-urea solutions. This cannot be denied, but the fact is, for many pulverized fertilizer grades, increased hygroscopicity has actually shown definite advantages. Accordingly, we can conclude that pulverized fertilizer manufacturers would be well advised to use urea-added solutions for just about every grade they produce.


# Arcadian NITROGEN SOLUTIONS

| | CHEMICAL COMPOSITION % | | | | | | PHYSICAL PROPERTIES | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Nitrogen | Anhydrous Ammonia | Ammonium Nitrate | Urea | Water | Neutralizing Ammonia Per Unit of Total N (lbs.) | Approx. Sp. Grav. at 60°F | Approx. Vap. Press. at 104°F per Sq. In. Gauge | Approx. Temp. at Which Salt Begins to Crystallize °F |
| **NITRANA®** | | | | | | | | | |
| 2 | 41.0 | 22.2 | 65.0 | — | 12.8 | 10.8 | 1.137 | 10 | 21 |
| 2M | 44.0 | 23.8 | 69.8 | — | 6.4 | 10.8 | 1.147 | 18 | 15 |
| 3 | 41.0 | 26.3 | 55.5 | — | 18.2 | 12.8 | 1.079 | 17 | -25 |
| 3M | 44.0 | 28.0 | 60.0 | — | 12.0 | 12.7 | 1.083 | 25 | -36 |
| 3MC | 47.0 | 29.7 | 64.5 | — | 5.8 | 12.6 | 1.089 | 34 | -30 |
| 4 | 37.0 | 16.6 | 66.8 | — | 16.6 | 8.9 | 1.184 | 1 | 56 |
| 4M | 41.0 | 19.0 | 72.5 | — | 8.5 | 9.2 | 1.194 | 7 | 61 |
| 6 | 49.0 | 34.0 | 60.0 | — | 6.0 | 13.9 | 1.050 | 48 | -52 |
| 7 | 45.0 | 25.3 | 69.2 | — | 5.5 | 11.2 | 1.134 | 22 | 1 |
| **URANA®** | | | | | | | | | |
| 6C | 43.0 | 20.0 | 68.0 | 6.0 | 6.0 | 9.3 | 1.180 | 12 | 39 |
| 6M | 44.0 | 22.0 | 66.0 | 6.0 | 6.0 | 10.0 | 1.158 | 17 | 14 |
| 10 | 44.4 | 24.5 | 56.0 | 10.0 | 9.5 | 11.0 | 1.114 | 22 | -15 |
| 11 | 41.0 | 19.0 | 58.0 | 11.0 | 12.0 | 9.2 | 1.162 | 10 | 7 |
| 12 | 44.4 | 26.0 | 50.0 | 12.0 | 12.0 | 11.7 | 1.087 | 25 | - 7 |
| 13 | 49.0 | 33.0 | 45.1 | 13.0 | 8.9 | 13.5 | 1.033 | 51 | -17 |
| 15 | 44.0 | 28.0 | 40.0 | 15.0 | 17.0 | 12.7 | 1.052 | 29 | 1 |
| **U-A-S®** | | | | | | | | | |
| A | 45.4 | 36.8 | — | 32.5 | 30.7 | 16.2 | 0.932 | 57 | 16 |
| B | 45.3 | 30.6 | — | 43.1 | 26.3 | 13.5 | 0.978 | 48 | 46 |
| Anhydrous Ammonia | 82.2 | 99.9 | — | — | — | 24.3 | 0.618 | 211 | -108 |

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St. Paul 14, Minn., 764 Vandalia St. ..... Midway 5-9141
San Francisco 4, Cal., 235 Montgomery St. ..... Yukon 2-6840

**SAFETY WINNERS—Employees of the Smith-Douglass Co. plant at Texas City, Texas, were recently rewarded with a raffle for 90 days without a lost time injury. After the first 30 days without a lost time accident, cigars were given to employees and upon completing the second 30 days without a lost time injury, cigars were again handed out. The raffle awarded one gift to Operations, Labor Force, Maintenance, and Office and Laboratory. D. F. Hurt of Operations won a gold watch; I. Johnson of the Labor Force won a barbecue grill; C. J. Ryder of Maintenance won an electric toaster; and Faye Carlton of Office and Laboratory won luggage. In the picture above, are D. R. Doyle (left), safety adviser; D. F. Hurt, operator, and C. J. Ryder, machinist as they display gifts won as a result of the plant's operating 90 days without a lost time accident.**

## Cotton Group Starts New Georgia Plant

CORDELE, GA.—The Cotton Producers Assn. put into operation in the spring of 1960 a newly-constructed plant in Cordele, Ga., for making granular fertilizer.

G. A. Burson, director of Plant Food Distribution for the Association, said that granular fertilizer has been enthusiastically received by patrons all over the territory covered by CPA. He said many farmers have said they plan to go to 100% granular.

D. M. Weatherly Co., of Atlanta, Ga., was the engineering firm that built the Cordele factory.

## Rapid Increase in California Fertilizer Deliveries Presages Possible Record Year

SAN FRANCISCO—Sales of commercial fertilizers in California jumped by more than ten per cent this past winter over the previous winter. This increase, one of the most rapid for a corresponding period, heralds the possibility of another new record year in fertilizer sales piled atop a series of record years. The Bureau of Chemistry of the State Department of Agriculture reports total sales of 350,259 tons for the period from January 1 through March 31, 1960. This figure compares with 317,589 tons for the same three months last year.

Leading fertilizer groups were the dry mixes, climbing between the two years from 72,176 tons to 79,964 tons, while ammonium sulfate and ammonia solution 20-0-0 reversed their positions in second and third spots. The former climbed from 46,234 tons to 52,579, while the latter dropped from 53,686 to 46,265 tons.

Holding its fourth place position was superphosphate normal, climbing by almost 50% from 23,494 tons to 32,875. The new fifth place position was attained by liquid mixes, rising from 18,712 to 22,407; and sixth place by anhydrous ammonia, up from 17,806 to 19,032 tons, both overtaking ammonium phosphate-sulfate 16-20-0, which dropped from 19,094 to 18,620 tons.

Following in order were calcium nitrate, up from 13,888 to 15,323; ammonium nitrate, down from 14,104 to 12,942; and ammonium nitrate solution 20-0-0, up from 6,475 to 9,119.

Among the dry mixes, 10-10-10 still remained the most popular despite a decline in sales from 10 142 tons to 8 450. The next in line was little more than half that total—10-10-5 up from 4 042 to 4,517. Greatest relative jump was registered by 16-20-0, which rose about 300% from 1,435 tons to 4 436; bypassing, in order, 17-17-0, which dropped from 4 676 to 3,795; formula 15-8-4, down from 2,959 to 2,327; formula 8-8-4, almost stationary at 1,833 and 1 875; and 6-10-4, dropping sharply from 3,054 to 1,829; and 11-8-4, dropping from 2,114 to 1,792.

Agricultural minerals registered an overall climb from 315,055 tons to 337,415, dominated as usual by gypsum, which rose from 294,290 tons to 315,648. Nothing else was significant. The only minerals with sales above 1,000 tons included sewage sludge, down from 9,596 to 6,761; soil sulfur, up from 4,053 to 4,474; lime-sulfur solution, up from 1,503 to 2,379; and two others with large relative gains — calcium carbonate up from 810 to 1,903 and magnesium carbonate, up from 596 to 1,311 tons.

### NAMED DIVISION CHIEF

EAST MELBOURNE, AUSTRALIA—Dr. Douglas F. Waterhouse, an insect physiologist, has been appointed chief of the Commonwealth Scientific and Industrial Research Organization, Division of Entomology. His appointment follows the retirement of Dr. A. J. Nicholson, who has been chief of the division for 27 years.


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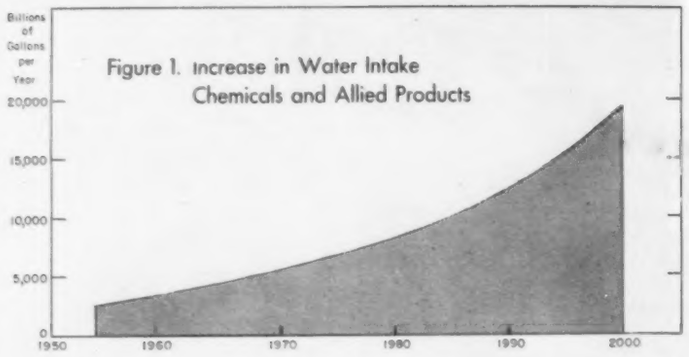



Source: Chemical and Rubber Division, BDSA.

**WATER RUNS UPHILL—How the need for more and more water for chemical industry is expected to increase in years ahead is shown in above chart prepared by U.S. Department of Commerce. Demand for year 2000 expected to reach exceptionally high consumption figure.**

# Chemical Industry's Use Of Water on Upward Trend

WATER, already a potential limiting factor in the chemical industry, will become even more so in the years ahead, according to estimates made by the Chemical and Rubber Division, U.S. Department of Commerce. As noted in the above chart, water consumption is not only on the increase at the present time, but the curve extends far into the future. Estimates on water consumption for the chemical manufacturing trade are expected to reach the astronomical figure of 13,300 billion gallons in the year 2000. Demand in 1959 reached an estimated 3,210 billion gallons, the report says.

To indicate the upward swing of water consumption, the report says that establishments in the Chemicals and Allied Products Industry Group that use 20 million gallons or more each year, reported a water intake of 2,380 billion gallons in the 1954 Census of Manufactures.

Of all manufacturers, the chemical industries were among the larger consumers of water in 1954, accounting for about 23% of the intake for all industrial uses.

About 10% of the establishments in the group use 20 million gallons or more of water annually and account for more than 95% of the water intake of the chemical industries. In 1954 the largest quantity, 83%, was used for cooling and air-conditioning; 10% was used for processing; and 7% for boiler feed, sanitary services, and miscellaneous.

Chemical industries use vast amounts of water as a reaction medium for washing large quantities of products and also as an effluent diluent. Water intake per unit of product or employee varies widely according to the particular industry. Projections of production indexes were available only on an industry group basis, therefore water requirement projections had to be made accordingly. Locations of production establishments covered by the 1954 Census were not so much a factor in water availability problems as they are expected to be in the future periods.

For many years, the Chemicals and Allied Products Industries have practiced conservation of water by retreatment and other means. In 1954, approximately two-thirds of the users of 20 million gallons or more annually recirculated or otherwise reused the water in the interests of conservation. Had this not been done, total requirements would have amounted to 4,088 billion gallons instead of 2,380, of which 1,708 billion gallons were recirculated. In estimating future requirements, the assumption was that the ratio of reused water to total intake would not increase materially.

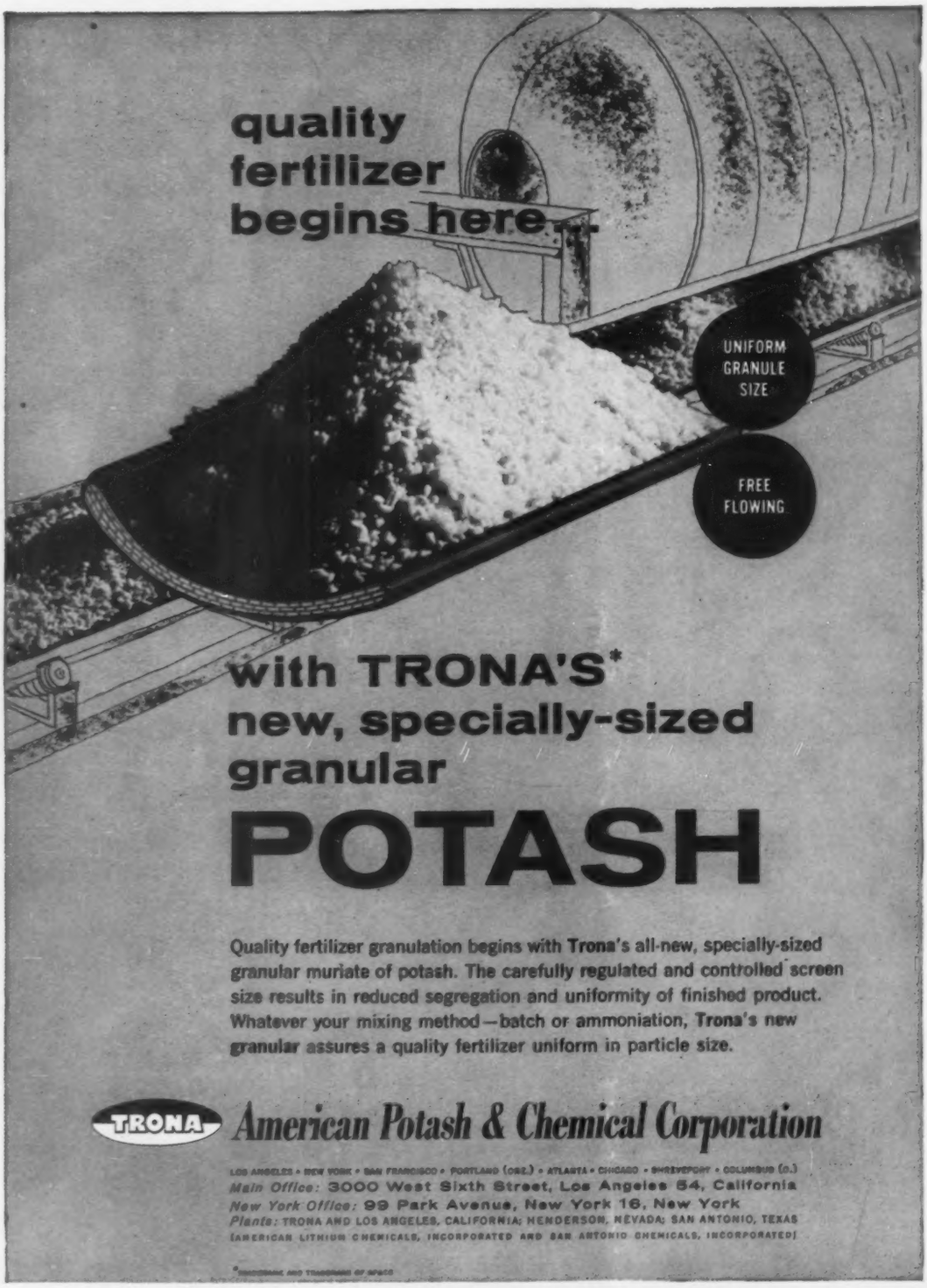
Brackish water used in 1954 amounted to 515 billion gallons, or 22% of the total intake. The Western Gulf region accounted for 63%.

Some brackish water is used as a raw material source, for instance in the production of magnesium and bromine. Its use, owing to the increasing cost of nonbrackish water, is expected to grow in importance from an economic standpoint, particularly as progress is made in water treatment and in combating corrosion and fouling of heat-exchangers caused by the use of brackish water. However, owing to the cost of overcoming corrosion and fouling of piping and equipment, the relative increase in the use of brackish water for the purpose is expected to be minimal.

Increasing reliance on petroleum as a raw material source for the chemical industry will lead to a higher concentration of plants in petroleum producing areas, and by 2000, water requirements for the Western Gulf region are expected to be tenfold those in 1959. Those in the Eastern Great Lakes and St. Lawrence region would about quadruple.

### NEW OFFICES

NEW YORK—Headquarters office personnel of American Metal Climax, Inc., and its operating divisions have occupied space in a modern building bearing the company name at 1270 Avenue of the Americas in Rockefeller Center here. As a result company executive management and its staff personnel are together under one roof for the first time since the company was formed at the close of 1957 by merger of American Metal Co., Ltd., and Climax Molybdenum Co.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# Rail Service Stops...Georgia Plant Moves to Adjacent City

TIFTON, GA.—When the Atlantic Coast Line Railroad decided to pull up its tracks and stop operating through Omega, Ga., John D. McLeod, owner and operator of Omega Fertilizer Works was faced with a big, new problem.

This problem was getting bulk materials to the factory, because previously the railroad had served this purpose.

After giving the matter serious thought, Mr. McLeod decided to build a new factory in Tifton, Ga., the county seat of Tift County, and in the same county with Omega. The new site is located nine miles northeast of Omega.

The result of this decision is a brand new fertilizer plant located on a three-acre tract beside the Atlantic Coast Line in the southern end of Tifton.

The plant, christened "McLeod's Fertilizers," manufactures plant food under the McLeod brand name. It was placed in operation in the spring of 1960 in time to catch the peak season of manufacturing. However, the "paper work" is still being done in the Omega plant, which will be retained as a bagging center and supplementary facility for the Tifton factory.

"Another reason for building an additional factory was to give better and faster service to our customers," Mr. McLeod said.

Although the railroad through Omega is gone, the old ACL depot will be a part of the McLeod Fertilizers operation in Tifton. Mr. McLeod bought the 20 x 60 ft. building and will move it to the Tifton site during the summer after the busiest manufacturing season is over. He plans to paint it white and use it for an office, and for the storage of nitrogen.

The new Tifton plant is 120 feet wide and 220 feet long, built according to Mr. McLeod's own design. He simply hired a superintendent to built it the way he wanted it.

Equipment in the Tifton factory includes three new elevators fabricated by C. C. Smith and Co. of Slocumb, Ala., and conveyor belts made by the same company. Other new equipment includes a Hercules spreader truck and a new Hough "Payloader."

Mr. McLeod said the new factory can make 40 to 45 tons of fertilizer an hour, and has storage space for 12,000 tons of finished product. Various analyses are manufactured as desired by customers.

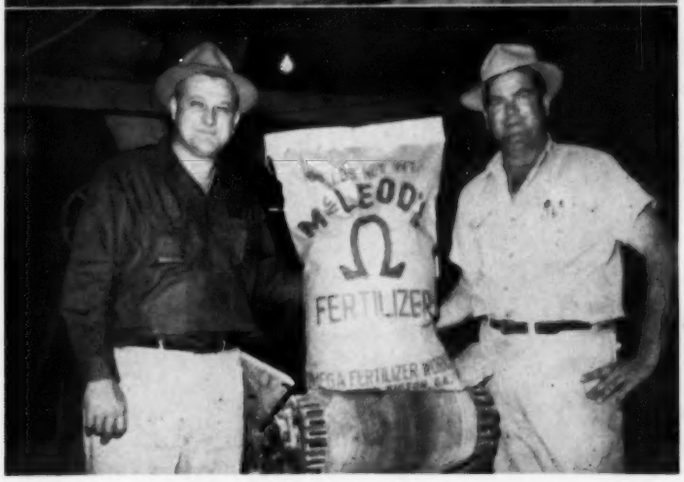
A. J. Frazier, Tift County man, is factory supervisor. He has been operating the new factory 24 hours a day during the peak season, but these hours will be reduced at other seasons of the year.

Mr. McLeod said the smaller Omega plant, 117 by 140 ft., will be used to bag fertilizers manufactured in the Tifton plant. During the rush season some materials are being carried to Omega for curing. Normally the Tifton plant will be used only for manufacturing purposes, but in the rush season it is being used for bagging as well. The Omega plant can store up to 4,000 tons of manufactured fertilizers.

A two-way radio system has been constructed between the plants in Tifton and the one in Omega. The Tifton and Omega plants each employ about 12 persons. Several trucks are operated by the two places.

Mr. McLeod said he will continue to reside in Omega, commuting to Tifton each day. He is serving as general manager of both the Omega and Tifton plants.

Mr. McLeod said the peak season in fertilizer manufacturing is about a month late this year due to the unseasonably cold March weather and unusually heavy spring rains. He said the peak usually comes in late March, but this year the heaviest volume was in mid-April and later.




**NEW FERTILIZER PLANT—McLeod's Fertilizers simply built a new plant in a nearby town when rail service ceased in the old location at Omega, Ga. Above is the new mixing plant at Tifton, Ga., nine miles from the old location. An office building will be moved in later. Lower photo: John D. McLeod (left), owner of the plants operating at both Tifton and Omega, and A. J. Frazier, superintendent of the Tifton plant, display 100 lb. bag of fertilizer just off the belt.**

## Construction Bids to Open

TIFTON, GA.—Bids for construction of a new entomology research building at Georgia Coastal Plain Experiment Station will be opened June 14, it was announced by General Services Administration, which is handling the project.

Should a bid be accepted work on the building is expected to begin some time in the summer. It was designed to serve for research work on grain insects, primarily corn insects.

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## PESTICIDE BOOKLET

★

**WASHINGTON—The National Agricultural Chemicals Assn. has published the 1960 special issue of "Pesticide Chemical Uses Accepted on a No-Residue Basis." Copies can be obtained from the association's headquarters in the Associations Building, 1145 19th St., N.W., Washington 6, D.C.**

## March Inorganic Chemical Production Reported

WASHINGTON — March production of certain inorganic chemicals has been reported by the Bureau of the Census, U.S. Dept. of Commerce.

Synthetic anhydrous ammonia output for March was 423,351 tons, compared with 381,279 tons for February. Ammonium nitrate production for March was also higher than February figures, with 288,066 tons being produced.

Production of nitric acid during March amounted to 304,503 tons or 23,794 tons more than February. Phosphoric acid output was 183,927 tons for March, higher than February.

Sulfuric acid production was 1,610,055 tons during March, considerably higher than February production.

campus.

### NAMED ASSOCIATE DEAN

BERKELEY, CAL. — Harry H. Laidlaw, Jr., bee breeding specialist at the University of California, Davis, has been named associate dean of the College of Agriculture.

## Production Started by IMC

TIFTON, GA. — A semi-granular type fertilizer was manufactured this spring at International Minerals & Chemical Corp. plant in Tifton for the first time.

Hoyt Whitesides, manager, said about four analyses of fertilizer were made in the semi-granular form. However, this type manufacture constituted only a very small part of the total amount made, the manager said.

He was uncertain, he said, as to whether there would be a continuation of the semi-granular work.


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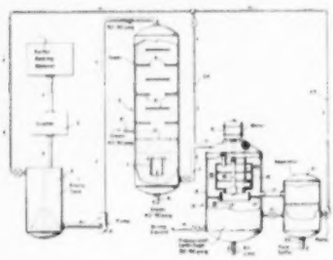
# PRODUCTION PROCESS PATENTS

**2,934,413**

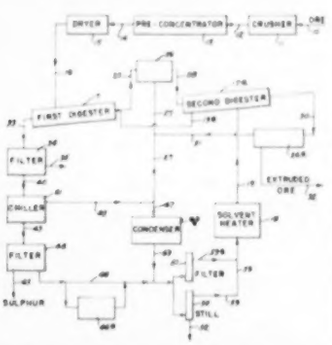
**Recovery of Elemental Sulphur from Sulphur-Bearing Materials.** Patent issued April 26, 1960, to Patrick J. McGauley, Port Washington, N.Y. The method of recovering elemental sulphur from sulphur-bearing material which comprises forming a water slurry of the sulphur-bearing material, heating the water slurry to a temperature above the melting point of sulphur in the presence of super-heated water to form a three-phase pulp containing super-heated water, liquid sulphur and solid gangue, cen-



trifuging the three-phase pulp at a temperature sufficient to maintain the sulphur in the liquid state while continuously maintaining the solid gangue in a water-wetted condition to separate super-heated water and liquid sulphur from the solid gangue, separating the super-heated water from the sulphur, and recycling a portion of the separated super-heated water to the centrifuge to aid in maintaining the solid gangue in a water-wetted condition.

**2,934,414**

**Extraction of Sulphur.** Patent issued April 26, 1960, to Philip R. Bradley, Jr., Berkeley, Cal., assignor to Alaska Juneau Gold Mining Co., Los Angeles. A method of refining sulphur which comprises providing a sulphur concentrate containing not less than about 50% of elemental sulphur together with impurities which are substantially completely insoluble in hydrocarbon solvents, said concentrate being in the form of particles not exceeding about ¼ inch, providing also a sulphur solvent in the form of a petroleum hydrocarbon mixture having a mixed aniline point less than about 50° F. and boiling substantially completely within the range of 250° F. to 450° F., heating said solvent to about 230° F., heating




said concentrate to expel free moisture therefrom and to raise the temperature thereof to about 230° F., passing the heated solvent and dry, heated concentrate countercurrently through an extraction apparatus, meanwhile maintaining the temperature of the solvent and of the concentrate at not less than about 230° F., maintaining such countercurrent contact under conditions of agitation sufficient to intimately contact the solvent with the concentrate, separating concentrate from the solvent at at least one point between the point of introduction of the concentrate into and its point of removal from said extraction apparatus, and draining the separated concentrate, applying suction to the thus separated concentrate to remove adhering solvent therefrom, separating enriched solvent at one end of the extraction apparatus and extracted solids from the other end thereof, draining and applying suction to the thus separated, extracted solids, chilling the enriched solvent to produce a slurry of sulphur and solvent, filtering such slurry to separate solid sulphur from liquid solvent, condensing solvent vapors recovered in the process, and recycling the filtered solvent and condensed vapors to the extraction apparatus after heating the same.

**2,934,412**

**Prilling of Ammonium Nitrate.** Patent issued April 26, 1960, to Leonard A. Stengel, Terre Haute, Ind., assignor to Commercial Solvents Corp., Terre Haute. In the process of preparing ammonium nitrate prills from molten ammonium nitrate with a moisture content not exceeding 0.5%, by spraying the molten ammonium nitrate in droplet form downwardly into a cooling gas, the improvement which consists in spraying the ammonium nitrate at low pressure through orifice openings substantially in the range of about 0.037 inch in diameter into said gas, and then recovering the resulting prills, said pressure and orifice size being so correlated as to produce free flowing prills characterized by a particle density from about 1.5 to 1.65 grams per cc. and mainly in the range of −10 +20 mesh.

**2,935,387**

**Compacting Process for Producing a Granular Product.** Patent issued May 3, 1960, to Ira B. Phillips, Carlsbad, N.M., assignor to Duval Sulphur & Chemical Co., Houston, Texas. The method of producing an improved quality of granular muriate of potash which includes, admixing a fine particle feed of muriate of potash with a useful amount of a water base liquid previously saturated with the soluble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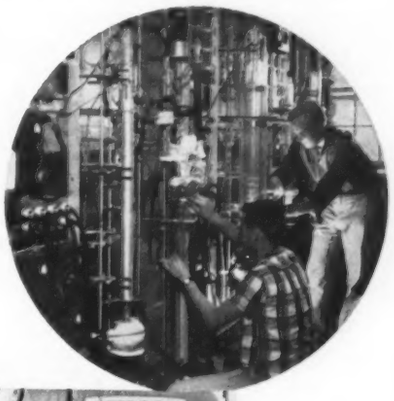

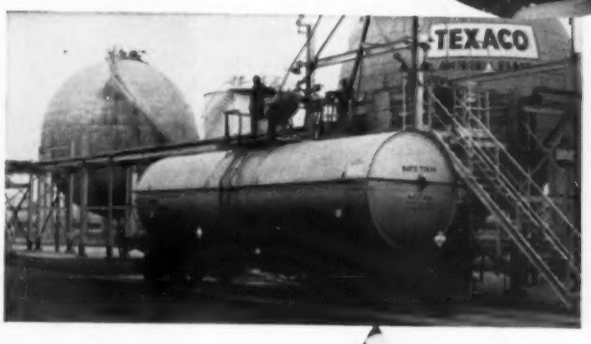


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constituents of the feed to form a solid-liquid mixture, conducting said solid-liquid mixture to a compactor at a temperature of at least 200° F., but less than the fusion temperature of the muriate of potash, compacting the mixture while at a temperature in excess of 200° F. but less than the fusion temperature of the muriate of potash into a sheet of compacted material, thereafter flaking the material, and finally crushing said material to the desired granular size.

**2,936,228**

**Process of Preparing Compound Fertilizer.** Patent issued May 10, 1960, to Pieter J. van den Berg, Sittard, Netherlands, assignor to Stamicarbon, N. V., Heerlen, Netherlands. In the process of preparing a compound fertilizer containing nitrate of ammonia and dicalcium phosphate from sedimentary phosphates which comprises the steps of decomposing said phosphate with nitric acid containing 50-65% (by weight) nitric acid to yield a calcium nitrate-phosphoric acid solution, removing a portion of said calcium nitrate to leave an acid liquor with a molar $CaO/P_2O_5$ ratio of 1.6:2.6 and with a $P_2O_5$ content greater than about 15% by weight, neutralizing said liquor with $NH_3$ and evaporating the neutralized liquor to produce a melt of said compound fertilizer, the improvement of advantageously inhibiting a detrimental substantial increase in viscosity of the liquor during the neutralization and evaporation steps which consists in: Combining with said process the step of diluting prior to the neutralization step, the acid liquor with at least one of the liquids selected from the group consisting of water and nitric acid to reduce the $P_2O_5$ content of the liquor to less than 15% by weight.

## Storage Facilities Bulge As Weather Slows Work

SALEM, ORE.—Fertilizer storage facilities were being strained due to a 27% drop in fertilizer deliveries in Oregon during the first three months of 1960. Cool, wet weather which has constantly hampered normal farm activities is blamed for the situation.

Oregon fertilizer sales during the first quarter of this year totaled 44,840 tons compared with 61,682 a year earlier.

Agricultural mineral sales suffered an even steeper decline, from 28,751 tons in the first quarter of 1959 to 2,617 tons during the same 1960 period—a 90% cut.

Good weather the second quarter of 1960 should take up much of the fertilizer sales drop as industry attributes the decline simply to inability to get farm operations fully under way.

## Safety Council's Fertilizer Section Announces Program

CHICAGO—Elmer C. Perrine, chairman of the fertilizer section, National Safety Council, will open the fertilizer section's sessions at the 48th National Safety Congress and Exposition on the afternoon of Oct. 17, 1960, in the Morrison Hotel, Chicago.

Included in the first session will be election of officers, a talk on "Mouth to Mouth Resuscitation," by Harry A. Veditz, Maryland Casualty Co., Baltimore, Md.; and a panel discussion on disabling injuries.

The participants on the panel will include Mike Ellison, protection supervisor, Mississippi Chemical Corp., Yazoo City, Miss.; E. J. Emond, director, automobile safety, Armour & Co., Chicago; R. L. Freemon, supervisor, safety and services department, Butler Chemical Co., Galena Park, Texas; Norman Maddux, plant manager, Florida Nitrogen Co., Tampa, Fla., and C. L. Riley, safety supervisor, O. M. Scott & Son Co., Marysville, Ohio.

The second session of the section will be held in the afternoon of Oct. 18 and will cover "Small Plant Medical Program," by Dr. G. G. Alexander, Industrial Medicine, Pasadena, Texas, and "Air Pollution," by Dr. Edward J. Largent, industrial hygienist, Reynolds Metals Co., Richmond, Va.

The executive committee of the fertilizer section will hold its fall meeting on Oct. 19.

## Bemis Reports Earnings Increase of 12%

BOSTON, MASS.—Net income of the Bemis Bro. Bag Co. and subsidiaries for the first three months of this year was $724,749, or about 12% higher than the first quarter of 1959, the company reported.

After taxes and preferred dividends, earnings per share of common stock were $1.02 for the first three months of 1960, as compared with 92¢ a year ago.

Consolidated sales for the first quarter were $32,419,792, slightly higher than those for the first three months of 1959.

In a quarterly report to stockholders, F. G. Bemis, chairman, and Judson Bemis, president, said:

"The economic pattern of the year thus far has not presented any distinct variations from that of 1959. Parent company sales, for instance, were somewhat lower for the first quarter of this year as compared to those of the first quarter of 1959, but the carry-over effect of the steel strike which was evident in January seems to have accounted for the difference. Sales in the last two months of the quarter have shown some improvement over prior year results.

"Although second quarter sales are normally lower than those of first quarter, it is expected that there will be little if any such seasonal decline this year because announced price increases for paper and paper bags should stimulate deliveries during this period."

## Agreement Signed For Portugal Plant

MILAN, ITALY — An agreement has been signed between Montecatini and Uniao Fabril do Azoto of Portugal for the construction of a 40,000 metric tons per year urea plant at Labradio, near the town of Barreiro on the Tagus River. The Portuguese plant will be the thirty-fourth major industrial unit using the Fauser-Montecatini process for urea manufacture.

The plant is being engineered by the M. W. Kellogg Co. and will incorporate up-to-date technology of the Fauser-Montecatini process.

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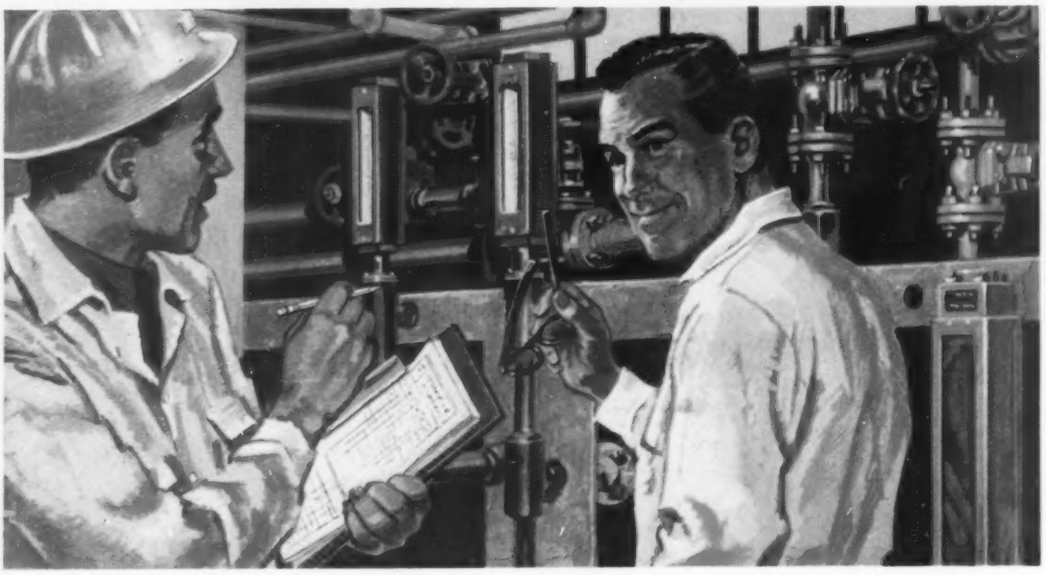

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KANSAS CITY, MO.—*201 E. Armour Blvd.*
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MINNEAPOLIS, MINN.—*215 South 11th St.*
OMAHA, NEB.—*3212 Dodge St.*
PASADENA, CALIF.—*317 N. Lake Ave.*
RALEIGH, N. C.—*401 Oberlin Road*
SALT LAKE CITY, UTAH—*68 South Main*
SPOKANE, WASH.—*521 E. Sprague*
ST. LOUIS, MO.—*4251 Lindell Blvd.*
TAMPA, FLA.—*3737 Neptune St.*
TULSA, OKLA.—*1708 Utica Square*
WICHITA, KAN.—*501 KFH Building*

Appointments . . . Shifts . . . Advancements

# Industry Personnel News

James V. O'Leary

Tom B. Potter

## Northwest Nitro-Chemicals Elects Top Executives

MEDICINE HAT, ALBERTA — James V. O'Leary has been elected president of Northwest Nitro-Chemicals, Ltd., and Tom B. Potter, executive vice president, it was announced June 2, following a meeting of the company's board of directors.

Northwest is the Canadian agricultural chemicals affiliate of Commercial Solvents Corp. Its principal plant is located at Medicine Hat, Alberta. Northwest manufactures high analysis fertilizers which are marketed throughout the prairie provinces of Canada and the north central and western United States.

Mr. O'Leary was previously general sales manager of Commercial Solvents Corp. Mr. Potter has been Northwest's sales manager since August, 1959.

Clifford D. Siverd

B. F. Bowman

## Cyanamid Appointments

NEW YORK—American Cyanamid Co. has announced two appointments in its Agricultural Division. Clifford D. Siverd becomes general manager of the division and B. F. Bowman, assistant general manager.

Mr. Siverd succeeds Frank S. Washburn who will retire in September, but until that time, will serve as special assistant to Kenneth H. Klipstein, executive vice president.

Mr. Siverd joined the firm in 1946 as a salesman. By 1957 he was made assistant general manager of the old Farm and Home Division, and when the Agricultural Division was formed in 1958, he became assistant general manager.

Mr. Bowman joined Cyanamid as general sales manager of the Fine Chemicals Division in 1954 and became marketing director of the Agricultural Division in 1958. The appointments of both Mr. Siverd and Mr. Bowman became effective on June 1, according to Wilbur G. Malcolm, president, who made the announcements.

Mr. Washburn, son of the founder of American Cyanamid Co., joined the firm in 1918 as a field representative selling cyanamide and phosphate rock. He became a regional sales manager of the old Fertilizer Division in 1924 and in 1939 was made director of fertilizer sales.

F. S. Washburn

Later, when the Agricultural Chemicals Division was formed, Mr. Washburn was made director and when the Agricultural Division was established, he was named general manager.

Mr. Washburn served as a director of Cyanamid from 1946 to 1955, was president of North American Cyanamid, Ltd., from 1951 to 1958, and president and a director of Cyanamid de Mexico, S.A., 1952 to 1958.

## New Advertising Manager

CHICAGO, ILL.—Kenneth A. Wilson has been named advertising manager of Victor Chemical Works, producer of phosphorus and phosphate chemicals. The announcement was made by M. R. Stanley, vice president of the recently merged division of Stauffer Chemical Co., in a move to reassign duties formerly held by E. M. Myers, Stauffer director of advertising.

## Manager Appointment

SKOKIE, ILL.—Henry W. Dahlberg, Jr., Wilmette, has been promoted by International Minerals & Chemical Corp., Skokie, to administrative manager for the agricultural chemicals division sales. He heads a new administrative department which will handle many of the financial and administrative functions previously handled by the division's four sales departments.

H. W. Dahlberg, Jr.

## Named Raymond Officer

MIDDLETOWN, OHIO—Myron S. Kem has recently been appointed to the position of treasurer of Raymond Bag Corp., Middletown.

Mr. Kem attended Ashland College and received his degree from Ohio State University. He also attended graduate school at the University of Chicago.

He is a member of Controllers Institute of America, Ohio Society of Certified Public Accountants and American Institute of Certified Public Accountants.

Myron S. Kem

(More Personnel News page 31)


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# Air Pollution Monitoring System Installed By American Cyanamid Controls Fumes

CINCINNATI, OHIO—That an air pollution monitoring system begun five years ago by American Cyanamid Co. at its Brewster, Fla., phosphate plant has been helpful in determining control measures necessary for maximum production without air pollution and a good public relations tool, was pointed out at the recent annual convention of the Air Pollution Control Assn. here. Charles R. McHenry, industrial hygienist in American Cyanamid's central medical department described procedures initiated in 1956 when the company decided to build a triple superphosphate facility in an expansion of its Brewster operations.

"Fluoride contamination is of increasing public concern, and the phosphate fertilizer industry is one whose manufacturing operations emit fluorides," Mr. McHenry noted.

Cyanamid's approach to ensure reduction of fluoride emission consists of three phases:

First: Incorporation of certain engineering controls in the blueprint specifications of the new plant.

Second: Undertaking a five-year environmental study still in progress, that includes continuous monitoring of fluoride content of air and water, soil samples and vegetation, and collection of meteorological data. This study, begun one year before the triple plant went into production, is being used to determine the efficacy of initial controls and the need for additional controls.

Third: Final evaluation of data obtained by monitoring, which will be made available to industry, government and other specialists concerned with air pollution.

Cyanamid's monitoring program is said to be the most extensive undertaken in the phosphate industry. For example, in carrying on atmospheric sampling, four continuous and dynamic sampling stations and 18 static sampling stations are located at distances up to 20 miles from the plant, Mr. McHenry reported.

Mr. McHenry described various methods of sampling, including laboratory evaluation of vegetation and streams in the area.

Studies have been used to determine a fluoride emission rate consistent with regulations set by the Florida Air Pollution Control Commission. Additional control equipment is being installed to accomplish this.

Cyanamid to date has spent more than $1,400,000 in studying and effecting air pollution control, Mr. McHenry stated.

Hi-Flo Gran-U-Lated Triple Superphosphate
Guaranteed min. 46% available $P_2O_5$

Hi-Flo Run-O-Pile Triple Superphosphate
46/47% available $P_2O_5$

Hi-Flo Blend-Phos Triple Superphosphate
45/46% available $P_2O_5$

Granulated Single Superphosphate
Guaranteed min. 20% available $P_2O_5$

NEW Run-of-Pile Single 20% Superphosphate

Phosphate Rock—All grades

Phosphoric Acid (75% $H_3PO_4$—54.5% $P_2O_5$)

Sulfuric Acid (60° Be; 66° Be;
98% $H_2SO_4$—Oleum 20-25%)

New Granulated Diammonium (16-48-0)
Phosphate

If Davison is going to help you build business, one thing is certain—we've got to offer more than good products. Davison is proud of its reputation of being the "standard of the industry" in phosphates. But we are even prouder of our reputation for working closely with clients . . . anticipating your problems, helping you simplify your operation.

In short, we make sure you get plenty of *service*, top *quality* always, product *dependability*, prompt *delivery* and readily available *technical assistance*—in other words—$SQ_2D_2TA$.

Try a test carload of the phosphates you use—and watch for that caboose-load of $SQ_2D_2TA$! Call us at Baltimore: SAratoga 7-3900, collect. We can ship *today* on any of the fine Davison products listed here:

**W.R. GRACE & CO.**
**DAVISON CHEMICAL DIVISION**
**BALTIMORE 3, MARYLAND**


# Reorganization Is Announced by Deere Chemical Division

PRYOR, OKLA.—Deere & Co. officers have announced major organizational changes, revised fiscal policies and a change in name for its Chemical Operations, heretofore identified as the Grand River Chemical Division.

The new name is John Deere Chemical Co. In keeping with Deere's decision to extend greater autonomy to this operation, the new company will have its own board of directors and officers.

Directors of the company are: E. M. Cook, chairman; L. A. Murphy; Bruce Lourie; W. W. Yeandle, and R. B. Ady.

Officers of the company are W. W. Yeandle, president; R. B. Ady, vice president, and K. B. Smith, secretary-treasurer.

Suitable changes on advertising media, packages for products, trucks, cars, tank cars, signs, etc., will require some time but should be completed by Sept. 1, 1960, the company says.

## New Plant Planned For Argentina

NEW YORK—A new phenol plant will be built in Argentina as the result of a loan approved on May 26 by the Export-Import Bank of Washington, D.C. The loan will be used entirely for purchase in the U.S. of various chemical equipment required by Duranor, Industrial Quimicas Sociedad Anonima Industrial y Commercial for this plant which will have a capacity of 25 metric tons of phenol per day. The total multimillion dollar plant investment, including buildings, other equipment, and land, considerably exceeds the amount of the loan.

Duranor was recently formed by Atanor, Compania Nacional para la Industria Quimica and Hooker Chemical Corp. Atanor, headquartered in Buenos Aires, Argentina, has plants at Munro, a suburb of Buenos Aires, and Rio Tercero, Argentina, while Hooker, headquartered in New York City, has 13 plants in the U.S., Canada, and Mexico.

## International Paper Announces Appointments

NEW YORK—The appointment of R. R. Worthington as assistant general manager, Bagpak division, International Paper Co., was announced by A. A. Scholl, division general manager.

Mr. Worthington, who joined International Paper as a chemist in 1934, has been a member of the Bagpak sales staff since 1936. He was appointed divisional sales manager in 1954.

Succeeding Mr. Worthington as sales manager, according to Mr. Scholl, will be R. A. Gair, Jr. Mr. Gair joined the division in 1949 as an apprentice salesman. He was named West Coast district sales manager in 1955.

C. H. Crain, who joined the company in 1948, also as an apprentice salesman, has been named to replace Mr. Gair as West Coast regional district sales manager. C. F. Evans of the Atlanta sales office, will assume Mr. Crain's former sales duties in the Chicago sales office.

### PURCHASING DIRECTOR

WILMINGTON, DEL.—William A. Hoffman, Jr., recently was appointed director of Hercules Powder Co.'s purchasing department by Albert E. Forster, Hercules president and board chairman. The appointment becomes effective July 1. Mr. Hoffman succeeds Edwin S. Ladley, who will retire at the end of June under the company's pension plan.

*Serving customers who buy $NH_3$ and Nitrogen Solutions . . .*

# *All in a Day's work for George*

George Day, that is. George is the man customers have come to depend upon for these reasons: (1) George is from Standard Oil, a supplier with 70 years' experience making products that meet specifications and delivering these products to customers *on time.* (2) The Standard Oil Anhydrous Ammonia and Nitrogen Solutions which George sells are produced in one of the industry's most modern plants located in one of the best railway and highway shipping centers in the U.S. (3) One of the Midwest's largest quality control laboratories insures the high quality and "on spec." character of these products.

Customers also know George can be depended upon to look after their needs. Twenty-three years' experience serving customers for Standard Oil has taught him how to give these customers the kind of service that means profits *for them.*

Would you like help from George Day? Call him at **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

*You expect more from* STANDARD *and you get it!*

# Olin Mathieson Increases High Analysis Production

PASADENA, TEXAS—Production of high analysis fertilizer products began on May 11 at Olin Mathieson's expanded facilities here. Sam L. Nevins, vice president of the corporation, activated the $15 million addition to the existing plant in ceremonies marking the occasion. The plant produces more than a ton of pelletized fertilizer each minute, marking a 40% gain in production capacity over the former facility.

The company announced that it will add new grades to its Ammo-Phos line of fertilizers. These will include 15-15-15, 16 48-0, 14-28-14, 7-28-28, 9-36-18, 13-39-13, and 12-24-24.

Olin Mathieson's facilities at Pasadena are well integrated and efficiently arranged. The Houston Ship Channel was described by Mr. Nevins as being "an ideal location for manufacture of fertilizer, both from the standpoint of shipping in raw materials and shipping out finished products."

Phosphate rock comes by water from Florida. Gulf vessels with cargoes of about 10,000 tons can unload at the plant. Smaller quantities can come in by barge through inland waterways that border the Gulf Coast.

The plant manufactures its own sulfuric acid from sulfur obtained nearby.

Ammonia comes by rail from the corporation's facilities at Lake Charles, La., about 150 miles to the east. Potash comes by rail from the Carlsbad area of New Mexico.

"Finished goods can move from Pasadena by rail or water to nearly all major fertilizer consuming areas of the United States," Mr. Nevins says. "In ocean-going vessels the fertilizer moves around the tip of Florida to the East coast where the corporation has fertilizer manufacturing and distributing facilities at Williamston, N.C., Baltimore, and Lebanon, Pa.

"Ocean-going vessels also take it to the Indies, South America and to the Orient through the Panama Canal. By inland waterway the product moves up the Mississippi, Ohio, Tennessee, Missouri and Illinois Rivers.

"It also is possible to use the inland waterway eastward across the Gulf Coast to Mobile and then up the Tombigbee and Warrior Rivers to Tuscaloosa and Birmingham, Ala.," he added.

"The product can travel north by rail from New Orleans to Chicago, with many junctions along this route for east and west shipment.

"Rails also can take the fertilizer through Birmingham to Atlanta; directly north to Little Rock and St. Louis; through Fort Worth to Denver or Oklahoma City and Wichita, and westward through Phoenix, the San Joaquin Valley of California up to Stockton, Calif."

The Pasadena plant was built by the government during World War II, and in 1947 was purchased from the government by Olin Mathieson at its full cost. It began operation in 1945, and except for breakdowns or power outages has never been shut down day or night since. The facility is one of more than 200 industrial plants that line the Houston Ship Channel, a man-made deepwater channel extending 57 miles, from Houston to the open waters of the Gulf of Mexico. The channel depth is 36 feet, its width varies from 300 to 400 feet.

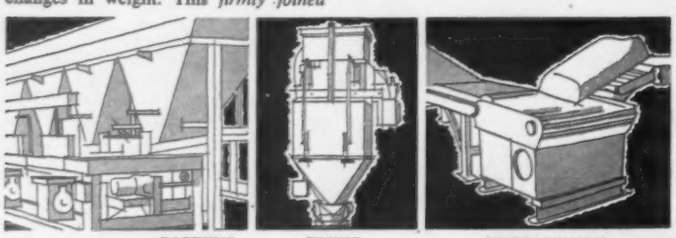
Early man was aware of the progressive inaccuracies of his pivot balance scales . . . but none knew how to remedy the situation.

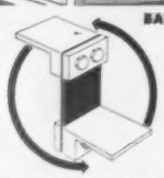
The problem was solved in 1956 when the United States issued a patent for a "Thayer Flexure Plate" Leverage System. A team of engineers and businessmen aware of industrys tremendous cumulative loss of materials in weighing operations, had devised a revolutionary new scale.

Knife-edge pivots that progressively wear and change were replaced by Thayer Flexure Plates that move only .001", yet accurately reflect the minutest changes in weight. This *firmly joined* lever withstands shocks and vibrations indefinitely. Dirt and dust are no longer a problem. Thayer guarantees this leverage system accurate for the life of the scale.

**How Can It Save You Money Year After Year?**

Working in conjunction with straight electrical controls, it forms the most reliable, low maintenance system ever devised to control processing or materials handling *by weight*. Literature on its application to filling, batching and checkweighing operations is available on request.



THAYER SCALE

AUTOWEIGHTION SYSTEMS FOR FILLING BATCHING AND CHECKWEIGHING

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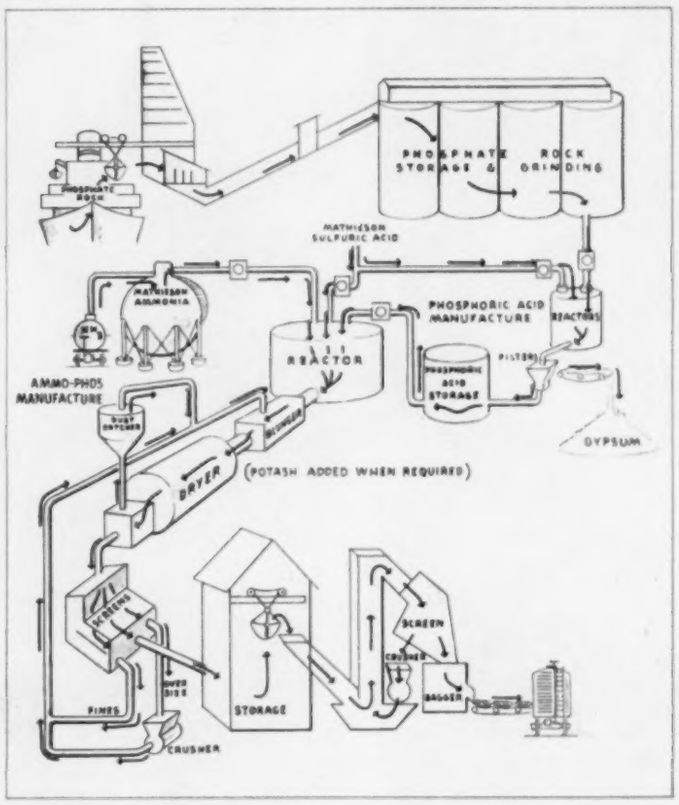


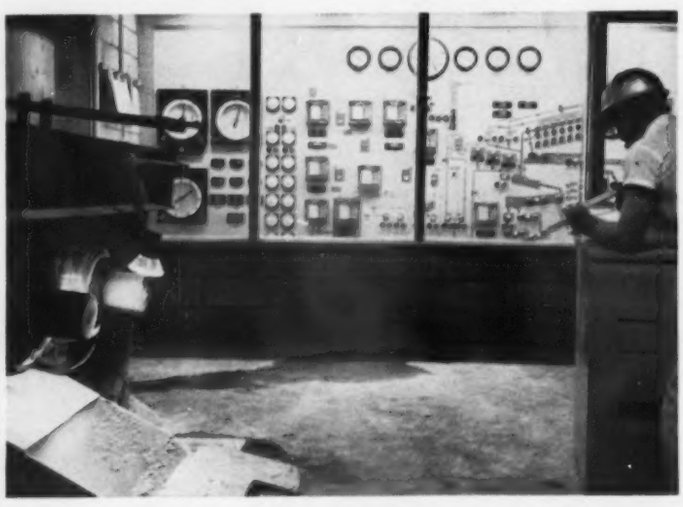

**NEW HIGH ANALYSIS PLANT—Olin Mathieson Chemical Corp. recently began operation of its new unit at Pasadena, Texas, on the Houston Ship Channel. Above is flow diagram of plant making "Ammo-Phos" granular product. The plant receives phosphate rock and other supplies by both ship and rail. In the lower photo is the control panel for the plant. An operator checks panel figures on his slide rule. Olin Mathieson says this plant is the largest of its type in the world.**

## Clayton O. Totman Joins Summers Firm

BALTIMORE—Summers Fertilizer Co. has announced that Brigadier General Clayton O. Totman, recently retired from the U.S. Marine Corps, has joined the firm's home office staff in Baltimore as assistant vice president. The appointment became effective June 1. His duties are associated with the company's various administrative departments including the development of a new soil and forest conservation division.

His final assignment in 25 years of Marine Corps service was in connection with the Navy's programs for conservation of soils, water, forests, grasslands, fish and wildlife at installations throughout the world. He has developed a sizeable tree farm in Maine to carry out his own conservation program. The Summers Co. plans to expand its activities in promoting the use of fertilizer in forest areas.

## Kraft Bag Changes

NEW YORK — Following the announcement of the completion and full operation of a new 300,000 sq. ft. multiwall bag manufacturing plant, at St. Marys, Ga., Edward Burgers, Jr., sales manager for the Kraft Bag Corp. (Gilman Paper Company subsidiary), announced the following sales staff appointments and changes:

P. F. Finley, formerly assistant sales manager, has been promoted to southeastern sales manager, with headquarters in Raleigh, N.C. He will be responsible for all sales in Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama and eastern Tennessee.

F. C. Joos, Jr., who has been covering southern Illinois, Missouri, Arkansas and eastern Oklahoma, working out of St. Louis, has been assigned the additional territory of western Kentucky and Tennessee.

P. E. Bray, who previously covered the entire state of Georgia, will now cover southern Georgia and Florida, and will work out of Jacksonville.

A. E. Rood, Jr., has been appointed to cover northern Georgia, Alabama and eastern Tennessee. He will make his headquarters in Atlanta.

R. E. Port has been appointed to cover Mississippi, Louisiana and Texas, working out of New Orleans.

R. E. Burke has been appointed to cover the states of Virginia, Maryland and Delaware. His headquarters will be in Baltimore.

## Consulting Agronomist

LOS ANGELES—M. E. McCollam recently retired director of the American Potash Institute, has been appointed consulting agronomist by American Potash & Chemical Corp. announced W. M. Clines, general sales manager, western.

Mr. McCollam held the post of agronomist at Washington State College's West Washington Experimental Station for nine years prior to his association with the potash industry in 1929.

He joined the American Potash Institute in 1935 and served with the organization until his retirement Jan. 1 of this year. Mr. McCollam will headquarter at AP&CC's San Francisco district sales office while on company assignments.

## Joins Patent Department

SKOKIE, ILL. — Donald G. Wolff has joined the patent department of International Minerals & Chemical Corp., Skokie, as a patent attorney. He was a patent attorney with Wyandotte Chemical Corp., Wyandotte, Mich., before joining IMC, and prior to that had been in patent law in the petroleum, food, and paper industries.

Mr. Wolff is a graduate of the University of Illinois and received his law degree from the State University of Iowa.

## Joins Laboratory Staff

JACKSON, MISS.—Addition of J. Dean Hansen to the staff of its Jackson branch laboratory was announced by the Niagara Chemical Division of Food Machinery & Chemical Corp.

Mr. Hansen will assist in Niagara's southern field development program centered at Jackson. He will be responsible for conducting field tests on new pesticides for cotton and other crops of importance to the area.

A graduate of the University of Nevada with a B.S. degree, Mr. Hansen later received his Master's degree in plant pathology at Auburn University.

### ARIZONA FIRM

CASHION, ARIZ.—Gail Van Tassell has opened Van's Fertilizer Co. have in Maricopa County, one of the finest agricultural areas of the State.

## New Mexico Potash Workers, Producers Agree on Contract

CARLSBAD, N.M. — A tentative agreement on a new two-year contract was reached June 1 between six New Mexico potash producers and the unions representing their employees.

The pact, which must be ratified by union members, calls for an 8¢ an hour increase during the first year and a 9¢ an hour increase the second year. Also included is a 21.55% bonus conversion to base pay.

Other contract improvements included better sick leave, supplemental workmen's compensation, improved vacation and the inclusion of three days off a year for attending funerals of family members.

Also won by the five unions was a modified form of union shop for the next two years of the contract. Under the terms of the contract all new hourly-paid workers must join the union which holds bargaining rights for the new workers' job.

No present employee will be required to join a union.

A severance pay plan was dropped by the union.

The unions which bargained as a group were the stoneworkers, boilermakers, machinists and operating engineers. The electrical workers bargained separately.

The six producers which bargained together were the Duval Sulphur & Potash Co., U.S. Borax & Chemical Co., Potash Company of America, Southwest Potash Co., National Potash Co., and the International Minerals & Chemical Corp.

Familiar face in Midwest fertilizer plants: U.S.I.'s Field Service Engineer Tom Martin checks granulation of product at Federal Fertilizer Co. plant in Danville, Ill.

*Here's U.S.I.'s Tom Martin . . .*

**LOOKING FOR WORK IN YOUR PLANT**

Tom Martin is U.S.I.'s Senior Field Service Engineer covering fertilizer manufacturers in the Midwest. His job: To help customers make the most efficient use of U.S.I.'s Ammonia, Nitrogen Solutions, Sulfuric Acid and Phosphatic Fertilizer Solutions (wet process phosphoric acid).

Tom knows materials, processes, equipment, formulations, costs. He'd like to put his knowledge and experience to work in your plant.

Why not get in touch with him? He's available for trouble shooting on any immediate production problem you may have. Tom will also help you calculate optimum formulations . . . suggest equipment . . . determine whether — and how — you can cut costs. He'll work with you setting up trial runs, and lend a hand until production is running smoothly.

If this U.S.I. service would be valuable in your operations, you can contact Tom Martin through our New York Sales Office. Write or phone collect. The number is OXford 7-0700.

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A BUSINESS PAPER FOR THE FARM CHEMICAL INDUSTRY

**Fewer Workers; More Output . . .**

# Report Shows Modernization of Fertilizer Industry Has Gained During 5-Year Period

STATISTICAL evidence pointing strongly to the modernization trend within the fertilizer industry is seen in a report just issued by the U.S. Department of Commerce on the fertilizer industry. The figures show a steady decline in the numbers of industry employees, a decrease in the number of hours worked by these fewer employees, and an increase in wages in the 5-year period 1954 through 1958.

It is to be assumed that this trend is still in progress and will continue to be for a considerable time in the future. The small profit margin in the industry dictates a tightening up of efficiency and adoption of the kind of economies made possible through mechanization and better equipment in general.

It has been said that the days of hand labor in the plant are over. The gang of shovel-wielders is nearly a thing of the past, thanks to stepped-up wage scales and the obvious economies seen in mechanization. Still, progress is not as fast as it should be in the direction of modernization.

**In the five-year period covered by the Census of Manufactures report, the numbers of production workers in the fertilizer industry declined 9%; from 24,600 in 1954, to 22,400 in 1958.**

The manhours worked declined even more, indicating more production per man, doubtless due to improved tools of production. In the area of manhours worked, the decline was 14%, dropping from 53,100,000 hours in 1954, to 45,500,000 hours in the latter year of the census period.

Reflecting greater production per man, wages were on the increase significantly. In the five years, they jumped 5%, according to the report, from $76,900,000 in 1954, to $80,800,000 in 1958.

**And, as every manufacturer knows, the cost of materials is likewise on an upward curve. The only surprising element in the census report, perhaps, is that the rise in this category was only 2%. In 1954, the cost of fuel, electricity, materials, and contract work amounted to $731,100,000. In 1958, the industry spent $742,200,000 for comparable items.**

Another significant item in the Commerce report is that of value added by manufacture in the industry. This increased 15% during the period of the census, from $272 million in 1954 to $312 million in 1958. Value added, the report states, is derived by subtracting the cost of materials, fuels, electricity, etc., from value of shipments. This avoids duplication in the value of shipments, and is regarded as the best value measure available for comparing the relative economic importance of manufacturing industries of geographical areas. (No adjustments were made in the money figures in the report, for price level changes from 1954 to 1958.)

Geographically, the South Atlantic states of Virginia, Maryland, North Carolina, Georgia and Florida boasted the largest numbers of workers and manhours, most money paid out in wages, most value added by manufacture, and greatest amount for capital expenditures.

The states of Ohio, Indiana and Illinois, designated as the East North Central region, saw a considerable amount of progress. In 1954, the total number of employees in the fertilizer industry there was 5,721, and the number had increased to 5,947 in 1958. The value added by manufacture made a big jump, however, during that time. In 1954, the amount was $60,084,000, but in 1958, it had reached $65,948,000.

The reasons for these changes would make an interesting and enlightening study. Although the number of employees increased in the latter region, it is likely that this reflects the establishment of new plants rather than any step-up in the number of men per plant.

The table below gives details of the Government study of the fertilizer industry, 1954-58:

| Region and State[1] | 1958 | | | | | | | | | | 1954 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All employees | | Production workers | | | Value added by manufacture | | Value of shipments[2] | Capital expenditures, new | No. of establishments with 20 or more employees[3] | All employees, number | Value added by manufacture, unadjusted[4] |
| | Number | Payroll ($1,000) | Number | Man-hours (1,000) | Wages ($1,000) | Unadjusted[4] ($1,000) | Adjusted[4] ($1,000) | ($1,000) | ($1,000) | | | ($1,000) |
| United States, total | 30,968 | 122,716 | 22,423 | 45,546 | 80,815 | 288,324 | 312,005 | 1,055,941 | 32,931 | 408 | 31,768 | 252,422 |
| New England | 528 | 1,919 | 402 | 779 | 1,363 | 3,992 | 3,880 | 18,232 | 250 | 7 | 661 | 4,970 |
| Middle Atlantic | 2,331 | 9,671 | 1,618 | 3,249 | 6,278 | 17,845 | 19,484 | 69,216 | 2,033 | 30 | 2,289 | 16,084 |
| New Jersey | 978 | 4,426 | 713 | 1,433 | 3,037 | 7,241 | 7,840 | 25,128 | 569 | 11 | 1,043 | 6,882 |
| East North Central | 5,947 | 26,567 | 4,340 | 9,132 | 18,224 | 65,948 | 69,983 | 245,261 | 8,859 | 76 | 5,721 | 60,084 |
| Ohio | 2,291 | 9,926 | 1,635 | 3,359 | 6,497 | 23,697 | 25,515 | 82,388 | 3,973 | 30 | 2,062 | 19,903 |
| Indiana | 1,145 | 4,742 | 885 | 1,832 | 3,296 | 13,205 | 14,132 | 53,400 | 1,692 | 18 | 1,026 | 11,587 |
| Illinois | 1,601 | 7,686 | 1,133 | 2,450 | 5,260 | 18,267 | 19,211 | 68,305 | 2,326 | 16 | 1,728 | 18,927 |
| West North Central | 1,876 | 7,323 | 1,376 | 2,792 | 4,900 | 17,136 | 19,474 | 89,776 | 1,154 | 26 | 1,974 | 18,546 |
| Iowa | 507 | 1,980 | 372 | 739 | 1,327 | 5,277 | 5,666 | 25,670 | 356 | 8 | 461 | 5,115 |
| Missouri | 628 | 2,660 | 432 | 954 | 1,686 | 5,506 | 5,859 | 26,414 | 434 | 7 | 515 | 5,888 |
| South Atlantic | 13,346 | 49,278 | 9,840 | 19,661 | 32,755 | 121,607 | 129,499 | 395,474 | 9,565 | 173 | 13,793 | 94,512 |
| Maryland | 1,515 | 6,222 | 1,078 | 2,206 | 4,053 | 11,490 | 12,770 | 45,115 | 1,308 | 19 | 1,571 | 13,088 |
| Virginia | 1,981 | 6,636 | 1,428 | 2,634 | 4,428 | 13,764 | 15,013 | 51,177 | 1,668 | 26 | 1,949 | 15,624 |
| North Carolina | 1,872 | 5,564 | 1,275 | 2,321 | 3,229 | 10,712 | 11,023 | 49,717 | 715 | 32 | 2,162 | 14,448 |
| Georgia | 2,189 | 6,410 | 1,646 | 3,054 | 4,077 | 10,417 | 11,540 | 36,034 | 646 | 37 | 2,771 | 11,180 |
| Florida | 4,667 | 21,159 | 3,571 | 7,800 | 14,815 | 69,260 | 72,182 | 165,550 | 4,749 | 40 | 3,688 | 31,551 |
| East South Central | 2,924 | 9,383 | 2,306 | 4,565 | 6,754 | 20,958 | 23,542 | 89,712 | 7,701 | 51 | 3,194 | 21,694 |
| Tennessee | 979 | 3,404 | 797 | 1,586 | 2,443 | 9,568 | 9,317 | 31,975 | (D) | 15 | 1,130 | 9,981 |
| Alabama | 1,002 | 3,069 | 777 | 1,556 | 2,154 | 5,962 | 6,522 | 27,467 | (D) | 19 | 1,135 | 5,338 |
| West South Central | 1,881 | 7,904 | 1,330 | 2,833 | 5,219 | 23,188 | 24,834 | 79,045 | 1,367 | 23 | 2,600 | 26,129 |
| Louisiana | 447 | 1,561 | 335 | 648 | 1,025 | 2,179 | 2,716 | 11,663 | 344 | 7 | 631 | 3,511 |
| Texas | 996 | 4,804 | 706 | 1,516 | 3,220 | 18,242 | 18,809 | 48,610 | 1,320 | 9 | 1,320 | 17,032 |
| Mountain | 831 | 4,142 | 550 | 1,118 | 2,488 | 6,162 | 6,754 | 19,384 | 801 | 4 | 730 | 3,754 |
| Pacific | 1,304 | 6,329 | 661 | 1,417 | 2,834 | 11,488 | 14,355 | 49,821 | 1,261 | 18 | 1,201 | 6,644 |

(D) Withheld to avoid disclosing figures for individual companies.
[1]Each producing State not shown separately in the above table was withheld either (a) to avoid disclosing figures for individual companies, in this or associated industries or areas, or (b) because the industry was of relatively minor economic importance in the State. (Additional publishable detail will appear in the final Census report on this industry.)
[2]Value of products shipped less cost of materials, supplies, fuel, electricity, and contract work.
[3]Adjusted value added by manufacture is the sum of (a) unadjusted value added, plus (b) the difference resulting from the purchase and resale of products without further manufacture, processing, or assembly, plus (c) the net change in finished products and work-in-process inventories between the beginning and end of year.
[4]For explanation see text under "Value of shipments."
[5]Except for "Number of establishments with 20 or more employees," the figures shown in the table are based on reports for all establishments (including those with less than 20 employees) classified in the industry.

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WASHINGTON CORRESPONDENT — John Cipperly, 604 Hibbs Bldg., Washington, D. C. (Tel. Republic 7-8534).

WESTERN STATES — The Maurice A. Kimball Co., Inc., 2550 Beverly Blvd., Los Angeles 57, Cal. (Tel. Dunkirk 8-6178); The Maurice A. Kimball Co., Inc., 681 Market St., San Francisco 5, Cal. (Tel. Exbrook 2-3365).

EXECUTIVE AND EDITORIAL OFFICES — 2501 Wayzata Blvd., Minneapolis, Minn. Tel. Franklin 4-5200. Bell System Teletype Service at Minneapolis (MP 179), Kansas City (KC 295), Chicago (CG 340), New York (NY 1-2452), Washington, D.C. (WA 82).

Published by
THE MILLER PUBLISHING CO.
2501 Wayzata Blvd., Minneapolis, Minn.
(Address Mail to P. O. Box 67, Minneapolis 40, Minn.)

Associated Publications—The Northwestern Miller, Farm Store Merchandising, Feedstuffs, Feedlot, Professional Nursing Home

# INDUSTRY MEETINGS

**June 21-22—Annual meeting, Southern Feed & Fertilizer Control Officials, Riverside Hotel, Gatlinburg, Tenn.**

**June 28-30—Pacific Branch Meeting, Entomological Society of America, Davenport Hotel, Spokane, Wash.**

**July 13-15—Eleventh annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City. B. R. Bertramson, State College of Washington, Pullman, Wash., chairman.**

**July 27-29—Great Plains Agricultural Council, 1960 meeting, Laramie, Wyo.**

**July 27-30—Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Texas.**

**Aug. 7-11—Rocky Mountain Conference of Entomologists, Cameron Pass, Gould, Colorado.**

**Aug. 10—Northeast Fertilizer Industry Safety Training School, New York.**

**Aug. 16-17 — Midwest Fertilizer Industry Safety Training School, Chicago.**

**Aug. 25-27—Southeast Fertilizer Industry Safety Training School, Wilmington, N.C.**

**Sept. 12-14—Eighth annual meeting and conference, Canadian Agricultural Chemicals Assn., Britannia Hotel, Lake of Bays, Muskoka, Ont., Can.**

**Sept. 24-26 — Western Agricultural Chemicals Assn. 31st annual meeting, Palm Springs Riviera Hotel, Palm Springs, Cal.**

**Sept. 29-30 — Northeast Fertilizer Conference, Hotel Hershey, Hershey, Pa.**

**Oct. 5-6—Southeast Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.**

**Oct. 17-21—National Safety Congress, 48th annual meeting. Fertilizer Section meets at Morrison Hotel, Chicago.**

**Nov. 3-4—Pacific Northwest Plant Food Assn. 1960 annual convention, Boise, Idaho.**

**Nov. 13-15—California Fertilizer Assn., 37th annual meeting, del Coronado Hotel, Coronado, Cal.**


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**KILL BITTERWEEDS, wild onions and dog fennel with R-H WEED RHAP. Low cost. Will not injure grass, grains; not poisonous. For free information write Reasor-Hill Corporation, Box 36CL, Jacksonville, Arkansas.**

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**$7.75** Complete
Mask $5.55 Goggles $2.25
Also complete line of equipment & insecticides.
Free Catalog
**HUB STATE CO.**
1255 N. Windsor, Indianapolis, Ind.


## DIVIDEND DECLARED

HOUSTON, TEXAS—The board of directors of Texas Gulf Sulphur Co. declared a regular quarterly dividend of 25¢ per share on the 10,020,000 shares of the company's stock in the hands of stockholders. The dividend is payable June 15, 1960, to stockholders of record May 31, 1960.

## INDEX OF ADVERTISERS

The index of advertisers is provided as a service to readers and advertisers. The publisher does not assume any liability for errors or omissions.


Allied Chemical Corp., Nitrogen Div. ....17-20
American Potash & Chemical Corp. ..... 22
Ashcraft-Wilkinson Co. ..... 34
Barnard & Leas Mfg. Co. ..... 13
Chase Bag Co. ..... 9
Davison Chemical Co. ..... 28
Duval Sulphur & Potash Co. ..... 34
Floridan Co. ..... 8
General Reduction Corp. ..... 21
Highway Equipment Co. ..... 33
Hough, Frank G., Co. ..... 27
Hub State Co. ..... 33
Kent, Percy, Bag Co. ..... 21
Phillips Chemical Co., a subsidiary of Phillips Petroleum Co. ..... 26
Potash Company of America ..... 3
Reasor-Hill Corp. ..... 33
Smith-Douglass Co., Inc. .....11, 12
Sohio Chemical Co. ..... 6
Southwest Potash Corp. ..... 23
Standard Oil Co. ..... 29
Star Enterprises ..... 13
Texaco, Inc. ..... 25
Thayer Scale ..... 30
Union Bag-Camp Paper Corp. ..... 5
U. S. Borax & Chem. Corp. ..... 7
U. S. Industrial Chem. Co. ..... 31
U. S. Phosphoric Products Division .....14, 15
Victor Chemical Works ..... 24


## SCHOOLS

(Continued from page 2)

pervisors to become indoctrinated with the meaning of safety and the importance of safety training in the plant. At the training sessions during the past two years, one company had five of their supervisors in attendance, and the safety director stated later that the value to their company of the organized training received was worth the cost of the entire school."

In commenting further on the purposes and objectives of the schools, Mr. Perrine says the schools are exactly what they imply. "They are not conferences but should be considered an integral part of management training." Among the subjects covered are included "The Scope of Safety Work"; "Safety Education and Training Fundamentals"; "Know Your Accident Problems, Elements, Sources and Effective Measures for Preventing Accidents"; "Safety Organization—The Leadership and Responsibility for Establishing an Effective Safety Program"; "The Supervisor as a Teacher and a Leader"; "The Handling of Liquid Materials in the Fertilizer Mixing Program," and other equally informative topics.

"All fertilizer companies are invited and strongly urged to be represented by as many supervisory people as possible at the safety training school being held in their area. Each subject is handled by a professional in that field, including members of industry, representatives from our universities, state and federal government safety engineers, insurance engineers, and National Safety Council representatives.

"Plants can't be run more safely by merely buying more insurance. If active safety programs are not carried out, then the fertilizer industry can expect to continue to carry a costly record of accidents. Here is the chance to get in on a healthy concentrated effort to stop these accidents and prove that the fertilizer industry can have a good, respectable record of safety."

Information concerning the five scheduled safety schools is available from the following persons in their respective areas:

Northeast section: S. M. McCargo, GLF Soil Building Service, Terrace Hill, Ithaca, N.Y.

Midwest: M. Peterson, National Safety Council, 425 N. Michigan Ave., Chicago, Ill.

Southeast: W. C. Creel, Department of Labor, Raleigh, N.C.

Far West: A. R. Cline, Shell Chemical Corp., Ventura, Cal.

Southwest: H. D. Haley, San Jacinto Co., Box 9747, Houston, Texas.

## Classified Ads

**Classified advertisements accepted until Tuesday each week for the issue of the following Monday.**

**Rates: 15¢ per word; minimum charge $2.25. Situations wanted, 10¢ a word; $1.50 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of $11 per column inch.**

**All Want Ads cash with order.**

### SITUATIONS WANTED

**MANAGER WITH TEN YEARS' EXPERIENCE** in mixed fertilizers, fertilizer materials, insecticides and anhydrous ammonia seeks a position on percentage of the profits. Address Ad No. 5963, Croplife, Minneapolis 40, Minn.

### HELP WANTED

**SALES MANAGER — PREFERABLY EMPLOYED** at present as salesman who has ambitions and the ability to better his present status, to promote a quality line of garden insecticides and products by an expanding, aggressive company. Send resume and expected remuneration. Strict confidence assured. Address Ad No. 5976, Croplife, Minneapolis 40, Minn.

## African Fertilizer Use

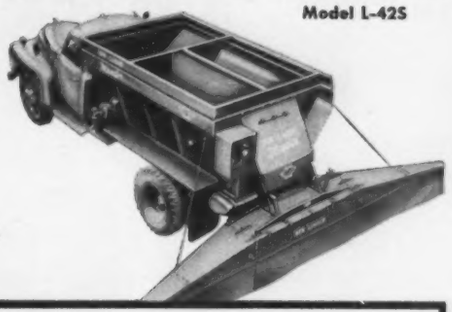
JOHANNESBURG, SOUTH AFRICA—Two-thirds of the fertilizer consumed in the Union of South Africa is used in the Orange Free State and the Transvaal. In the heart of this area a modern $7 million fertilizer factory has been built, with an annual production capacity of 200,000 tons of superphosphate, 112,000 of granular mixtures, and 75,000 of sulphuric acid. Eventually the company expects to export to the Rhodesias and other countries in Africa. Raw materials for the plant, such as potash and some phosphates, will continue to be imported, according to South African sources.


**Accurately Blends and Spreads 3 Fertilizers at Once!**

# NEW LEADER MOBILE BLENDER

**Model L-42S**

- **Lets you offer mixed analysis at lower, bulk rates!**
- **3 Separate compartments!**
- **36" Conveyor synchronized to speed of truck by drive shaft drive!**
- **7.0 H.P. Engine drives Twin Spinners!**



**DEMAND FOR CUSTOM SPREADING IS GROWING**

More and more farmers want the convenience of a bulk spreading service. It saves them time, equipment and maintenance expense *plus*, up to $4–$8 per acre over bagged goods. Let us help you get started in business with "New Leader".

MAIL TODAY
**HIGHWAY EQUIPMENT COMPANY**
6788 D Ave. N. W. Cedar Rapids, Iowa

NAME.....
ADDRESS.....
TOWN.....STATE.....
☐ Farmer ☐ Operator ☐ Student

Mail coupon for L-42S literature and a copy of "Your Land Is Different" a booklet designed to help you sell more bulk fertilizer.

## CALENDAR FOR 1960-61

**JUNE**

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**AUGUST**

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**OCTOBER**

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**NOVEMBER**

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**JANUARY**

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**FEBRUARY**

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**MARCH**

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